

RHODODENDRONS & AZALEAS

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GARDEN FLOWERS IN COLOR



GARDEN FLOWERS
IN COLOR

EDITED BY
R. HOOPER PEARSON
MANAGING EDITOR
OF THE *GARDENERS'*
CHRONICLE. . . .



PLATE I (*Frontispiece*)

ANTHONY KOSTER

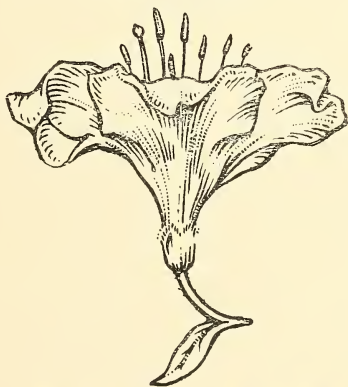
THE BEST YELLOW VARIETY OF R. SINENSE



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Rhododendrons & Azaleas

*By William Watson
With Eight Coloured
Plates*



GRIFFIN A. PLEISS

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PREFACE

IT is difficult to understand why a book on Rhododendrons, within the means of ordinary gardening folk, has been so long in making its appearance. That there has been a steady and growing demand for such a book is a well-known fact. The reason is probably that there are very few people qualified to write the book, and it is doubly fortunate that Mr. Watson has been induced to undertake the task. No one is better qualified ; no one is more familiar with the cultural requirements of Rhododendrons or has a more thorough knowledge of this interesting genus in all its species, varieties, and hybrids. Mr. Watson has already done much to develop the popular taste for Rhododendrons, and to help and encourage other workers, but by writing the present volume he has earned the gratitude of every cultivator.

As to the merits of Rhododendrons there can be no question, and no one who has seen a good collection at flowering time, or who has quietly enjoyed half-an-hour on a bright day in early summer studying the effects of large, mixed clumps of even the commoner and older varieties, will disagree with the statement that they are "by far the most valuable of all hardy evergreen flowering shrubs ever introduced." I certainly do not quarrel with it. Of many plants it is said, or has been said, "Their day has come." The day of the Rhododendron came with the introduction

of *R. ponticum* some 250 years ago ; it has remained, and will not wane. It must be remembered that the season of flowering is a prolonged one. The species commence flowering early in February with such sorts as *R. dahuricum*, *R. parvifolium*, *R. fulgens*, *R. præcox*, and *R. Nobleanum*, and they continue until August, when *R. calophyllum* and *R. Maddenii* delight us with their fragrant, white blossoms. I once saw in a shaded dell in Co. Wicklow, on 24th February, a large plant some twenty feet high of one of the very early hybrids covered with good trusses of bright pink flowers, some of which cut in the bud state, just expanding, lasted for ten days in water. Rhododendrons are sometimes planted in unsuitable positions, and much of their effectiveness is thereby lost. There are hillsides covered with them in their native countries, and there is no reason why the same condition should not prevail in many parts of the British Isles. The effect would be startling and brilliant. A beginning has been made at Howth Castle near Dublin, where the late Lord Howth planted hundreds of both species and varieties on some bold cliffs about 150 feet high, facing to the east. In this position the effect, when the plants are in flower, is most pleasing and imposing, very different to that of the little groups crowded together, so often seen on lawns. It cannot be wondered that so many people attempt to grow Rhododendrons even where failure is almost certain. A sight of some of the newer hybrids, such as Beauty of Tremough, Glory of Penjerrick, and Loderi, would make most people determine to have these plants in their gardens if possible ; but where there is lime in the soil, or where strong winds prevail, it is practically impossible to grow them. For myself, the species interest me most, and I maintain that they are at least as beautiful

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as the hybrids ; but others will have none of this, and they smile pityingly at what they term misguided enthusiasm. There are over 300 known species, whilst explorations in China, and elsewhere, are still adding to the number. The number of hybrids already exceeds the number of species, so there is ample choice for us all.

FRED. W. MOORE.

ROYAL BOTANIC GARDENS,
GLASNEVIN.

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RHODODENDRONS AND AZALEAS

CHAPTER I

INTRODUCTION

AMONG the many exotic trees and shrubs that have made themselves at home in the British Islands, the several sections of Rhododendrons are perhaps the most valuable. The conditions afforded by an insular climate and soil are peculiarly adapted to the requirements of a group of plants which in nature inhabit moist or swampy situations on high mountain ranges, and are rarely found in places where extremes of sunshine or cold are experienced. Rhododendrons love moisture, both at their roots and overhead; and they dislike excessive sunshine. Their objection to lime limits their general cultivation to those parts of these islands where the soil is non-calcareous. Fortunately such parts are plentiful, and Rhododendrons and other lime-hating plants can be made quite happy in them.

There are Rhododendrons for the coldest as well as for the mildest parts of this country. Most of the less hardy species from the Himalayas flourish in South Cornwall, South-West Ireland, and South Wales, where the atmosphere is constantly humid and the heat of summer and the cold of winter are tempered by their geographical position. Trees and shrubs from New Zealand, Chili, California, China, and Japan, which in other parts of our islands are unable to

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find congenial conditions, have become established in those parts where the Himalayan Rhododendrons are happy.

The richness of the British garden flora is due to the exceptional advantages our climate provides. Fortunately, a love of gardening has for centuries prevailed among the people of this country, and this has led not only to the introduction of plants of all kinds from foreign countries, but also to experiments in their cultivation and their improvement by cross-breeding and selection. In no genus, except the Rose, has this passion for growing and breeding been so productive of great results as it has in Rhododendron. It is difficult to imagine what the gardens and parks of this country were like in winter before the introduction of exotic evergreen trees and shrubs. The first of the showy Rhododendrons to be grown in England was *R. maximum*, which Philip Miller says was first flowered by James Gordon of Mile End in 1756. *R. ponticum* was introduced a few years later by Conrad Loddiges of Hackney, "who sold the first plant to the Marquis of Rockingham, a noble encourager of botany and gardening." *R. caucasicum* was introduced in 1803, but never became common. *R. catawbiense* was not known here until the commencement of the nineteenth century, when the celebrated traveller-collector, John Fraser, sent it, together with many other North American plants, to his nursery in Sloane Square. According to Loudon, it was "most common" in gardens in 1838.

The Rhododendron as a garden shrub is therefore a modern creation. Its popularity did not really commence until breeders made use of the Indian species, particularly *R. arboreum*, and, by crossing it with existing sorts, added variety in flowers and habit to what had previously been bred from the older species, namely, *R. ponticum*, *R. caucasicum*,

and *R. catawbiense*. No doubt the development of open-air gardening which took place in this country in the latter half of last century had a quickening influence on the spread of the Rhododendron. It then became the fashion to plant collections of hardy trees and shrubs, more especially evergreens, in large gardens and parks, and whilst many of the plants that were tried then have since gone out of cultivation or out of favour, Rhododendrons have proved to be by far the most valuable of all hardy evergreen flowering shrubs ever introduced.

English nurserymen have done much to foster a love of hardy plants. This is to be commended, because far more pleasure is derived from the cultivation of plants in the open air, where all the conditions are approximately natural, than from the most elaborate arrangement for gardening under glass. Rhododendrons contribute largely to the pleasures of the garden in "God's own greenhouse." They are presentable at all times, far more so than many of the leafy evergreens which are so commonly planted as garden furniture, and which never look different from year's end to year's end. Take as an example the common *R. ponticum*. We have no shrub to equal it, either as a hardy evergreen which stands town smoke ; as a park shrub for planting in masses to serve as a screen or to furnish a pleasing object in the landscape ; to provide shelter and cover for game ; to clothe large areas with evergreen foliage ; or to help to fill a shrubbery. The habit of the plant, the healthy green of its shapely foliage, and its hardy constitution are all very good qualities in an evergreen. To these there is still to be added the beauty of its flowers. It may be faddish to say so, but I am not alone in the opinion that *R. ponticum*, when happily situated in a wood or as a large bold mass on the grass in the open, is, when in flower, the most effective of all Rhododendrons.

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There is a softness in the shade of purple, an elegance in the form and pose of its flower-heads, which are not easily equalled. Of course, the plant itself is always so "fit," and its habit and foliage are so perfect, that the flowers are bound to look well on it. If the breeder had never operated on *R. ponticum*, if it had been still the only evergreen Rhododendron in British gardens, it would still have to be given first place as an all-round useful shrub.

I have never seen a big display of the other old species, *R. caucasicum* and *R. catawbiense*, and it is difficult to account for the fact that they have never become common garden plants in this country. They are the reputed parents of many beautiful hybrids and crosses, but it is more than likely that the best of these with respect to habit and constitution have *R. ponticum* blood in them. Questions of breeding are, however, dealt with in another chapter.

The Azalea section of hardy Rhododendrons has a garden history not unlike that of the evergreens. The species were in cultivation for many years—only, however, in the gardens of the "curious"—before they were turned to account and brought forward as ornamental shrubs for every garden. They haven't got to that position even yet, although they have every right to it, always providing the soil is to their liking. If only the makers of gardens and parks and pleasure grounds—of any kind of place, in fact, where plants and flowers are to form permanent objects of interest—would make more use of these Azaleas than they do now, there would be less astonishment evinced by our people when they see them in flower in the few places where their merits have been recognised and their attractions are displayed.

Gardening is something like politics and religion.

People hold certain views, have certain beliefs, because their parents held them ; or they see no reason for change because they have never looked for one. In like manner, and for the same reason, gardens are made and planted with the same old staggers—Laurel, Privet, Aucuba, Cupressus, and a few others, with a Rose or two and perhaps a Lilac and Mock Orange for flowers. Not bad plants in themselves, but they are poor makeshifts as furniture for a present-day garden.

Rhododendrons, as grown by the nurserymen who specialise in them, are the perfection of flowering shrubs. There is more to be said in favour of collections of them in those gardens where the conditions are suitable for such plants, than there is for collections of any other hardy shrubs, except perhaps Roses ; and for some reasons one might even omit that exception. When it is understood that for its size the Rhododendron is satisfied with less attention and yields a great deal more pleasure than any other shrub grown, tender as well as hardy, we may expect to see more attention paid to it. The great displays made every year in London by the Messrs. Waterer, and in the Royal Gardens, Kew, do not, it is to be feared, convey to those who see them the truth with respect to Rhododendrons as garden plants. Too many people still believe that only under very exceptional conditions, and with special cultural skill, can the good Rhododendrons be grown successfully. It is not many years since it was realised that the natural soil and conditions at Kew were suitable for them. The best advice that can be given to those who have not tested their gardens and parks for Rhododendrons is to plant a few of them in a suitable position and note their behaviour.

CHAPTER II

BOTANICAL CHARACTERS

RHODODENDRONS, including Azaleas, are either trees or shrubs, varying considerably in stature and habit, with hard, close-grained wood. Their leaves, which are either deciduous or evergreen, are entire, thick and leathery, or herbaceous, glabrous or clothed with hairs or scales, often felted beneath. Before developing they are enclosed in scaly bracts, which are often gummy. The flowers are produced in terminal heads, rarely axillary, and when in bud they are enclosed in scales, like the leaves. The calyx has five lobes, but it is sometimes almost obsolete; corolla campanulate or funnel-shaped or tubular, usually five-lobed; stamens five or ten or more; anthers oblong, dehiscing by terminal pores; style long or short; stigma capitate; ovary five to twenty celled; ovules very numerous; fruit a woody capsule containing very many small seeds.

The genus now includes all the plants previously known as Azaleas, Indian, Chinese, and North American. It is generally thought that the merging of Azalea into Rhododendron is recent; but, as a matter of fact, it was proposed by the botanist Salisbury over one hundred years ago. He then wrote: "To the genus Rhododendron I have no hesitation in referring all the Azaleas of other authors. They agree minutely in habit, inflorescence, filaments, anthers, pollen, fruit and seeds. Mere number of stamens appear to be of no consequence whatever. The deciduous and evergreen

species cross freely with each other, hybrids from the two being now in the nursery of Mr. Thompson, at Mile End." American botanists, however, do not accept this view, for they continue to call all their deciduous species or Swamp Honeysuckles, Azaleas, limiting *Rhododendron* to the evergreen, Laurel-like plants. British horticulturists also prefer to keep the two separate, and for garden purposes there is no good reason why they should not do so. In gardens, therefore, are the following: *Rhododendrons*, represented by *R. caucasicum*, *R. arboreum*, *R. hirsutum*, and *R. javanicum*; Indian Azaleas, represented by *R. indicum* and *R. Kämpferi*; and Swamp Honeysuckles, represented by *R. viscosum*, *R. calendulaceum*, *R. sinense*, and *R. flavum*.

The deciduous species are all natives of North America and Northern Asia, including China and Japan. All those found in the Himalayas and the Malaya are evergreen. It is remarkable that a solitary deciduous species, *R. flavum*, is found in Asia Minor, and another, *R. sinense*, in China. The Malayan *Rhododendrons* have a well-marked character in their flowers, which are fleshy and tubular, as in the tuberose; in colour they are some shade of yellow or red, whilst the leaves are coriaceous and evergreen. The nearest approach to them among the Himalayan species is *R. cinnabarinum*. A few species differ widely from the others; *R. Kamtschaticum*, for example, a low-growing shrub, 6 inches high, with deciduous leaves and Azalea-like, solitary carmine flowers, 2 inches across, is quite unlike any other species. Then there are some with Heath-like leaves, others with the aspect of Myrtles, and so on.

The genus is decidedly protean, and whilst all the species possess special characters which differentiate them from

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the other members of Ericaceæ, there are certain well-marked differences among them, especially with respect to their breeding with each other. It is noteworthy that whilst the species of each section intercross, as, for example, *R. flavum* with *R. sinense*, *R. javanicum* with *R. malayanum*, and *R. indicum* with *R. amœnum*, no one has yet raised hybrids between *R. arboreum* and *R. javanicum* or between *R. indicum* and another. There are hybrids between the deciduous Azaleas and the *catawbiense* section, for which the name *Azaleodendron* has been proposed.

Seeing that the cultivated Rhododendrons inside the limits here noted interbreed quite freely, that their flowers are attractive to insects on account of the honey they secrete, and that the reproductive organs are so arranged as to facilitate cross-pollination, it is not unlikely that hybrids sometimes occur amongst the wild plants. Certainly some of the plants recognised as species have what may be termed a mongrel look. This was the subject of observation by the late Mr. H. J. Mangles, who, in answer to an inquiry whether there was any marked variation amongst Rhododendrons when raised from seeds, wrote as follows :—

“In venturing to give an answer to this question, so far as my observation and experience among Himalayan Rhododendrons permits, I will for the present confine the word ‘seedlings’ to plants grown from seed imported from their native places, that is to say, plants of the first generation, and my answer must be in the negative. I believe that a packet of seed, gathered from the same species and in the same locality, will yield in Europe seedlings, not, of course, absolutely uniform, but certainly showing no marked difference. This result, although often questioned, was

PLATE II
PINK PEARL



Flower of the Day

surely to be expected, seeing that Himalayan Rhododendrons are mostly social plants, and it is borne out by our experience with the old-fashioned *R. ponticum*, which, when kept apart from other species and hybrids, continues true for many generations. Certainly, for the first generation, the seedlings of Himalayan Rhododendrons are often produced in great numbers, almost absolutely alike. Sometimes this uniformity descends to later generations, and sometimes even to hybrids. Thus Mr. J. Sheppard has raised about 150 hybrids between *R. Edgeworthii* and *R. formosum*; most of the seedlings have bloomed, and he can see no difference whatever in any of them. I must not, however, at present go so far afield, but confine myself to the assertion that carefully collected native seed will, when grown in this country, faithfully reproduce the parent type.

“The circumstances attending the collection of wild Rhododendron seeds, and the fact that ripe seed and blossoms are seldom to be seen together, will explain how many smaller differences have escaped the observation of collectors who have gathered the same species from different localities, from different elevations, or perhaps from different sides of the same valleys. Such an explanation is surely more philosophical than the notion that so many variations have arisen—not gradually, but all of a sudden—from cultural influences. My readers will apprehend how interesting botanically it is to find such a variety of types packed together in so small a compass, for instance, as Sikkim; but they will, of course, remember the character of the country and its climate, where alpine and almost tropical conditions occur side by side. The Heaths at the Cape of Good Hope give an example of great variation in the same family, but Dr. Becarri’s remark on the Rhodo-

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dendrons of Borneo offers the best, and a very curious, analogy. His words are very striking:—‘According to my personal observations it appears that almost every mountain top in Borneo has its own special forms, which do not seem to spread themselves, at least on the adjoining mountains.’”

In the following pages, whilst the species are printed in italics, the hybrids are in Roman type, whether they are known by latinised names or not.

ECONOMIC PROPERTIES

The economic uses of *Rhododendron* are not important. According to Professor Sargent, they possess bitter, astringent, and narcotic properties. A decoction of *R. chrysanthum* is employed in Siberia in the treatment of rheumatism and other affections of the joints and muscles, and is now used in some European countries for the same purpose. The buds of *R. ferrugineum* are used in Northern Italy in the preparation of an anti-rheumatic liniment, and in the United States a decoction of the leaves of *R. maximum* is occasionally used for the same purpose. Honey obtained from the flowers is believed to be poisonous, yet the flowers of the Indian *R. arboreum* are eaten fresh or made into a conserve, although the buds and young leaves are said to be poisonous to cattle. Goats and sheep have been poisoned by the leaves of *R. cinnabarinum* and *R. afghanicum*. The dried leaves of *R. campanulatum* are used in India as snuff, and the leaves of *R. lepidotum* and *R. anthopogon* as stimulants. The Chinese use the leaves of various species to adulterate tea. In this country *Rhododendrons* are not usually eaten by animals, not even by rabbits and hares, but when they have been eaten by accident their effect has been noxious.

CHAPTER III

RHODODENDRONS IN NATURE

THE species of *Rhododendron* are widely distributed. They occupy in the flora of those countries where they are abundant the same position as the Heaths do in others ; indeed, in their effect upon other forms of vegetation, there is a close similarity between Heaths and *Rhododendrons*. They monopolise considerable areas, few other plants being able to hold their own against them. They object to soils containing lime or chalk, preferring peat, and they love the open country. None of the species can rightly be called tropical, those found in the tropical zone, as, for instance, the Malaya, New Guinea, and Philippine species, occurring at considerable elevations where the conditions are temperate or sub-tropical. The limits of their distribution appear to be the cold of Lapland, Kamtschatka, and Siberia, and the intermediate conditions of the mountains of Java and New Guinea. There are none in New Zealand, none in Africa, where Heaths abound, and none in South America, the plants known as Andean *Rhododendrons* being *Befarias*. Considering their abundance in Northern Asia, it is surprising that there are so few in North America, where the conditions appear to be suitable for them.

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The number of species now known is about 300, their distribution being as follows :—

China and Japan	162
British India	46
Malaya	62
North America	16
Orient	6
Europe	4
Siberia	3
Arctic Regions	2

One is reported as being wild in Australia on Bellenden Ker Mountain at an elevation of 5000 feet, where it is said to form a tree 20 feet high.

CHINESE

The following interesting note on the Rhododendrons of China is by Mr. E. H. Wilson, who has during his several botanical expeditions to that country discovered many new species and sent home fresh seeds of them from which plants have been raised :—

“In China, the genus *Rhododendron* extends from sea-level to the limits of ligneous vegetation. It is the largest genus recorded from China, no fewer than 150 species being known. I myself have collected 80 species, and about 20 of these are new to science. Seedlings of these are now at Kew and in other collections, and we may therefore hope soon to become acquainted with them as garden plants. There is no heather (*Calluna* or *Erica*) in China, and its place on the alpine moorlands is taken by dwarf, small-leaved Rhododendrons such as *R. fastigiatum*, *R. nigro-punctatum*, *R. intricatum*, and *R. blepharocalyx*.

CHINESE RHODODENDRONS 15

"The low-level species, such as *R. indicum* and *R. sinense*, are abundant on scrub-clad hills and, whilst the former extends from the east to the west of the country, the latter scarcely occurs west of long. 112°. In Central and Western China, with the exception of the above two species and *R. Mariesii*, no Rhododendron occurs below 4000 feet. Above this altitude they occur in woods and forests in increasing numbers, reaching their optimum at about 11,000 feet. In the regions traversed by me, 15,500 feet was the altitudinal limit of the genus. Farther west, however, it is somewhat higher. Rhododendrons are gregarious plants, nearly every species having a well-defined habitat. In size they vary from alpine plants only a few inches high, to trees 40 feet high. In colour they range from pure white, through clear yellow, to rich shades of scarlet and crimson. At low levels, miles of the hill-sides often are ablaze with the scarlet *R. indicum*. Up to 9000 feet the Rhododendrons occur in constantly increasing numbers, in company with mixed dicotyledonous trees and shrubs and conifers. Above 9000 feet they form the predominant shrubby vegetation, either as undergrowth in the conifer forests or above the tree limit, where they form impenetrable thickets. In late May and June these areas present a scene of indescribable beauty."

Some of the Chinese Rhododendrons are wild also in Japan. One of the best is *R. Fortunei*, which has large, white, fragrant flowers, with six or seven segments. It was introduced by Fortune in 1859, and has proved to be quite hardy in the warmer parts of the British Islands. *R. indicum* (*Azalea indica*) is a native of China and Japan, and in a wild state it has either persistent or deciduous leaves and small, reddish flowers. Like certain other plants of

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these countries, this *Azalea* has been cultivated for centuries by the natives, and we owe some of the varieties that we grow in our greenhouses to-day to their skill in breeding. It may with truth be said that the *Azaleas* are to Japan what the *Heaths* are to Europe, the sides of the hills often being covered with them, and the improved varieties are in almost every garden there. The most effective of them is *R. sinense* (*Azalea mollis*), which American travellers declare to be quite equal to their own *R. calendulaceum* in the great blaze of colour it produces when it bursts into flower in spring. It was introduced into England in 1824, and again in 1845 by Fortune. There are now produced annually in Europe more plants of *R. sinense* and *R. indicum* than of all the others put together.

INDIAN

In British India there are about fifty species of *Rhododendron*. They are most abundant in the Sikkim Himalaya, where they cover large areas. Their beauty and interest are shown in Hooker's *Rhododendrons of the Sikkim Himalaya*. There is also an interesting paper on them by Sir Joseph Hooker in vol. vii. (1852) of the *Journal of the Royal Horticultural Society*. To Sir Joseph Hooker we owe the introduction of many of the species as the result of his botanical explorations in the Himalayas about sixty years ago. He has told us that: "It is especially between 10,000 and 14,000 feet that the genus prevails; several species comprising three-quarters of the bulk of the vegetation above the forest region (12,000 feet). There *Rhododendron* wood supplies the natives with fuel, and various utensils. The bark and leaves are also brought into service. They are the traveller's

INDIAN RHODODENDRONS 17

constant companion throughout every day's march : on the right hand and on the left of the devious paths the old trees and bushes are seen breast-high or branching overhead, whilst the seedlings cover every mossy bank. At 13,000 feet the flanks of the snowy mountains glow with the blood-red blossoms of *R. fulgens*, whilst the beauty of *R. campanulatum* and the great elegance and delicacy of the yellow bells of *R. campylocarpum* excite the more admiration from their being found in such regions of fog and rain. Yet with all these advantages of position and that of an intimate knowledge of the species, I was constantly at a loss to distinguish to which species the seedling plants belonged, especially when they grew intermixed, or to recognise others when distant from their parents."

The Rhododendrons are most abundant in the Raja independent State of Sikkim, and they increase in number in advancing northward from Darjeeling to the snows. Darjeeling is situated at an elevation of 7200 feet, and its mean temperature is 55°. It is never so hot in summer nor so cold in winter as it becomes in London. We know that Sikkim Rhododendrons are happiest in those parts of England which are in close proximity to the sea—for example, South Cornwall, South Wales, South-West Ireland, and the West of Scotland.

A well-marked section of the genus, *Vireya*, characterised by thin valved capsules and long-tailed seeds, inhabits chiefly the high mountain forests of the Malay Peninsula and Islands, New Guinea and Australia. Something like sixty species have been found there, only about half-a-dozen of which have been brought into cultivation, namely, *R. Teysmannii*, *R. jasminiflorum*, *R. javanicum*, *R. Lobbii*,

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R. Brookianum, *R. multicolor*, and *R. Malayanum*. Judging by herbarium specimens, there are many more than these with strong claims to the attention of horticulturists. Under cultivation they have proved to be too tender to thrive in the ordinary greenhouse, subtropical conditions being necessary for them. A useful race of perpetual-flowering hybrids and seedlings has been raised from the several species named above. They cross freely with each other, but all attempts to breed a hybrid between this and either of the other sections of the genus have so far failed.

NORTH AMERICAN

There are sixteen species of *Rhododendron* in North America, one of which, *R. maximum*, the Rose Bay, is arborescent. The other evergreen species are *R. californicum*, *R. macrophyllum*, *R. punctatum*, and *R. catawbiense*, the last named being one of the parents of the popular garden race of hardy sorts. It grows on the summits of the Alleghany and Appalachian mountains, often forming dense thickets through which the traveller can make his way only by following old bear paths. Here also grow some of the deciduous Azaleas or Swamp Honeysuckles, such as *R. arborescens*, *R. calendulaceum*, *R. nudiflorum*, and *R. viscosum*. These colour wide stretches of country when they are in flower in May or June. In an account of a trip in June 1892 to the Roan Mountain in North Carolina, Professor Sargent gives the following particulars of *R. catawbiense*, which was then in bloom: "Along the borders of the forest, sometimes scattered individually and often in broad masses, covering hundreds of acres, the *Rhododendron* grows, mixed with bushy plants of the Mountain Alder.

No one can judge of the extent of the *Rhododendron* fields on this mountain, for the extent is so vast that the eye cannot estimate areas; certainly there are spots on the summit from which thousands of acres covered with *Rhododendrons* and *Alders* can be seen at once. The thickets are impassable except where bears and cattle have forced tortuous trails among the bushes which ten days ago were covered with flowers. These are nearly all of one colour, deep rosy pink, although an occasional plant with darker flowers can be found. The soil where these plants grow is rich black vegetable mould, varying from 18 inches to 2 feet in depth. Although saturated with moisture, as small springs are common, the surface soil is perfectly drained, being underlain by coarse gravel mixed with large stones. Abundant atmospheric moisture, for rarely a day passes without clouds settling over the summits of the Roan, increases the vigour of the plants. On the open slopes they rarely grow more than 4 or 5 feet high, but when protected by the Balsams (*Abies Fraseri*), specimens 10 to 12 feet high are not uncommon. These natural conditions seem to indicate that *Rhododendrons* of the *catawbiense* blood require rich, moist, well-drained soil, constant atmospheric moisture and protection from high winds, and that, under such conditions, they can support excessive winter cold, as the temperature on the summit of the Roan has been known to fall in winter to 30° below zero, while ice probably forms during every month of the year, except in July and August."

As to the hardiness of those garden sorts of which *R. catawbiense* is one of the parents, it is necessary to bear in mind the nature of the other parents, and as some of these are Himalayan and therefore more tender, the cold-

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resisting nature of their hybrids is sure to be more or less influenced by them. The quality of the soil that is suitable for garden Rhododendrons need not be what is known as rich, as they certainly grow well and are happy when planted in a light, sandy soil over a gravel subsoil.

The Swamp Honeysuckles are chiefly natives of north-eastern regions and high mountain ranges. The earliest to flower are *R. canadensis* (Rhodora) and *R. nudiflorum* in April, then *R. calendulaceum* and *R. occidentale* in May and June, the latest being *R. arborescens* and *R. viscosum*, which are in bloom in July. They are abundant in swampy land, often at considerable altitudes, and when in flower they produce an effect of great magnificence.

EUROPE

It is remarkable that, although the climate and other conditions in many parts of Europe are specially favourable to Rhododendrons, only very few species are natives, and these chiefly in alpine regions. There are evidences in the Miocene rocks of Central Europe of Rhododendrons, and they were quite common in the Arctic regions of both hemispheres during the Tertiary period. The only species which have been able to retain a foothold in Europe are *R. lapponicum* in Norway, *R. ponticum* in South Spain, *R. ferrugineum* and *R. hirsutum* in the Swiss Alps. *R. ponticum* reappears in Asia Minor, Syria, and in the Southern Caucasus with *R. flavum* (*Azalea pontica*) and *R. caucasicum*.

R. ponticum was introduced into Ghent before 1763 and is of special interest as being the plant on which the genus was founded and the first to become naturalised in

England, where it comes up freely in woods from self-sown seeds. It is one of the parents of the first hybrid Rhododendron raised in this country. It is commonly used as a stock for the more delicate kinds, and in the United States, according to Mr. Parsons, it is valuable not only as a stock for seedlings of *R. catawbiense*, but also for the Ghent Azaleas in places where they will not thrive on their own roots. There are old woods in England in which this fine, useful evergreen is represented by huge bushes, almost trees. In the Queen's Cottage Grounds at Kew there are some grand masses which in May or June are mounds of purple flowers.

There is another Pontic Rhododendron, known to gardeners as *Azalea pontica*, and to botanists as *Rhododendron flavum*. It is the deciduous, twiggy, hairy-leaved yellow or orange flowered shrub which grows a yard or so high, is as hardy as Box, and flowers profusely in spring. Seeds of it were first sent to England by Dr. P. Pallas, who collected them in the Crimea and gave them to Messrs. Lee and Kennedy of Hammersmith. This is the plant whose flowers are said to poison the honey obtained from them. Mr. H. J. Ross has stated in the *Gardeners' Chronicle* that the poisonous principle is got rid of by heating the honey. It has never been recorded that honey is affected in this country by this Azalea, although the flowers are favourites with bees.

R. dahuricum was introduced into England from Russia by a Mr. Bush about one hundred years ago, and was distributed by Messrs. Lee and Kennedy. It is a rather scraggy, sparsely-leaved shrub, remarkable as an early flowerer, as it sometimes is in full bloom in January. It is one of the parents of that very useful hybrid, *R. præcox*,

which is a good border Rhododendron and a most serviceable forcer. *R. chrysanthum*, a native of Siberia, is a dwarf evergreen with the habit of *R. caucasicum*, and trusses of beautiful, golden-yellow flowers, an inch in diameter. Although not satisfactory in this country as a garden plant, it is worth the attention of breeders. There are plants of it in the Kew collection. Another refractory species is the dwarf, Myrtle-like *R. lapponicum*, found in North America as well as in the north of Europe and Asia. Finally there is the northern *R. Kamtschaticum*, with the habit of a rock-rose, deciduous, tongue-shaped leaves, and large, red, Azalea-like flowers. A child of the snows, it has never become established in British gardens, although it has been known and tried often since its first introduction about one hundred years ago. It is successfully cultivated at Kew in a north frame where it can be kept fairly cool in summer and from the effects of changeable weather in winter, though it is capable of withstanding any degree of cold in this country. It appears to be happy when planted in a shallow pot in sandy peat and Sphagnum-moss. The flowers are produced in June. The plant grows abundantly in muddy mountainous places in the islands and along the coasts in the neighbourhood of Behring Strait, extending southwards to Sachalin and the north of Japan and eastward to Bank's Island, off the coast of British Columbia. In Greenland, it forms dense, tufted masses, which become crimson cushions in June when they flower.

CHAPTER IV

HYBRIDS

BEAUTIFUL as are many of the species of *Rhododendron*, and adapted as they are to the conditions of climate and soil of most parts of the British Islands, at the same time they are not all first-class garden plants. Either they get spoilt by frost, or they fail to set their flowers, or their colours are not pleasing, or their habit is imperfect. It is therefore fortunate that they will hybridise freely, and that breeders early took advantage of this. The popular garden sorts are, for the most part, seedlings which have descended from hybrids raised nearly a century ago. Comparatively few of the species have yet been turned to account in this way, though *Rhododendron* fanciers are active enough now in breeding from such species as are likely to yield new types.

The earliest hybrid *Rhododendron* whose history is recorded was produced about the year 1820 by the nurseryman, Mr. Thompson, Mile End Road, through the accidental crossing of *R. ponticum* with *R. nudiflorum* (*Azalea nudiflora*). This hybrid is in cultivation to-day under the name of *R. odoratum* or *R. azaleoides*, and is remarkable for its agreeable fragrance and good behaviour under ordinary conditions. Other crosses between true *Rhododendrons* and Ghent *Azaleas* have since been raised, and the name *Azaleodendron* was proposed for them by the late Dr. Masters. The pretty, Honeysuckle-like *R. Williamsii* is one of these. The first really important hybrid was *R. alta-*

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clarensis, raised at Highclere in 1826, where *R. arboreum*, which had been introduced from India six years earlier, was crossed with *R. catawbiense*. Although the last named had been crossed with the common *R. ponticum*, the Indian blood was needed to give variety of colour and those other qualities which characterise their hybrid descendants.

Among the earliest breeders of Rhododendrons was Dean Herbert. In his classical treatise on *Crosses and Hybrid Intermixtures among Plants*, written nearly a century ago, he pointed out that Rhododendrons offered a rich field to the hybridisers. He believed that all the species would intermix, and had even tried to cross *R. indicum* with other species, but found it refused to blend with any but its own immediate kindred, which is the experience of breeders to-day. The Dean crossed the Pontic Azalea with Rhododendron, and the American Azaleas with *R. arboreum*. He noted that the hybrids from *R. arboreum* were impatient of wet; also that they never bore fertile seeds. He also raised crosses between the Pontic and American Azaleas, between *R. sinense* and *R. calendulaceum* (thus anticipating the successes of Messrs. Cuthbert and Koster), between *R. ponticum* and *R. catawbiense* ("an amazingly florid hybrid"), between *R. maximum* and *R. arboreum* (surely a good cross, but not now known to be in existence), between *R. caucasicum* and *R. arboreum*, and others. He recognised the importance of breeding for a later flowering habit and urged the use of *R. maximum*, which flowers in midsummer, to counteract the bad influence in this respect of *R. arboreum*.

Breeders to-day might make more use of the North American *R. maximum*. It grows on the Appalachian mountains up to an elevation of 3000 feet, often forming thickets hundreds of acres in extent, and is a bushy tree up

PLATE III

SAPPHO

ONE OF THE BEST BLOTCHED VARIETIES



to 40 feet high, with stout branches forming a round head, large, Laurel-like, evergreen leaves, and flowers in a compact head with pink pedicels and white corollas spotted with green on the upper segments. They expand in June and July, and are singular in having a young leaf growth by the side of the flower-head.

Other successful breeders of Rhododendrons in the early part of last century were Messrs. Loddiges, Lee and Kennedy, Standish, the Waterers, Jas. Veitch, and Booth of Hamburg amongst nurserymen, and the Earl of Carnarvon and the Earl of Liverpool amongst amateurs. More recent successful breeders were Messrs. Cunningham, Davis, Noble, Seidel of Dresden, and of course John and Anthony Waterer, I. Anderson Henry, H. J. Mangles, and Luscombe.

A species which, by its exceptionally good qualities and well-marked characteristics, has been productive of numerous beautiful hybrids, is *R. Griffithianum*. Introduced from the Sikkim Himalaya in 1849, it first flowered in a nursery at Wandsworth in May 1858. What may be called a Chinese form of it, differing mainly in having usually six or seven flower segments instead of five, was introduced in 1859 by Fortune, and named in compliment to him. These two plants, thanks to the efforts of Mangles, Luscombe, Anderson Henry, Gill, Sir E. Loder, and a few others, have been the means of enriching gardens with a race of Rhododendrons possessing all the attributes of first-rate, hardy, large-flowered shrubs.

The first Griffithianum hybrids were raised in the gardens of the Lawson Company at Edinburgh, in or about the year 1869, when Mr. Scott crossed *R. Griffithianum* and the red-flowered John Waterer, supposed to be a hybrid between *R. arboreum* and *R. catawbiense*. In 1879 these

crosses were seen by Mr. Mangles, and described in the *Gardeners' Chronicle* in July of that year. They are still in cultivation in Scottish gardens, and they so closely resemble the hybrid *R. kewense* (*Griffithianum* \times *Hookeri*), that they might easily pass for that plant. In April 1882, Mr. Mangles exhibited his hybrid Alice Mangles, which he raised from *R. ponticum* and *R. Griffithianum*; it had flowers 4 inches across, whitish-lilac in colour, and very fragrant.

R. Manglesii, raised by Messrs. J. Veitch & Sons from *R. Griffithianum* and the white-flowered album *elegans*, is of excellent habit and very floriferous, the flowers in erect racemes, their colour blush-pink in bud, pure ivory-white when expanded, with crimson spots on the upper segments. Forms of *R. Manglesii* are now known under such names as White Pearl, Princess Juliana, Gauntletii, and Loder's White, &c. *R. kewense*, raised at Kew from *R. Griffithianum* and *R. Hookeri*, first flowered in the Temperate House in May 1888. It bears large, erect racemes of flowers, each 4 inches across, and varying in colour from white to deep rosy pink. It is quite hardy, and, if it escapes late frosts, it makes a grand display in May.

In the garden of Miss A. Mangles at Littleworth, Tongham, Surrey, there is an exceptionally rich collection of Rhododendrons, including many of the hybrids raised by her brother, the late Mr. H. J. Mangles of Haslemere. There are many *Griffithianum* crosses amongst them, two of the best being Isabella Mangles and Liza Stillman. All these hybrids are perfectly hardy in the south and west of England.

Another batch of *Griffithianum* hybrids was raised by Mr. R. Gill in the garden of Mr. H. Shilson, Tremough, near Falmouth, by crossing that species and *R. Thomsonii*. The

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best of them are Beauty of Tremough, Glory of Penjerrick, Goliath, and Gill's Triumph. Their flowers are larger than those of kewense; otherwise they are not unlike them, though their colours are richer. Gill also raised hybrids between *R. Griffithianum* and *R. arboreum*, in which the flower-buds are deep crimson, the expanded flower being rosy red, with blotches of deep crimson at the base of the tube.

The most recent successful Griffithianum cross was made by Sir E. Loder, in whose gardens at Leonardslee there is a rich collection of Rhododendrons, many of them very large specimens. He crossed *R. Griffithianum* with *R. Fortunei*, and obtained a grand hybrid which has been named *R. Loderi*. The flowers are very large, with six or seven segments, and they have a delightful fragrance. The plants are vigorous growers and are as hardy as *R. Fortunei*.

About twenty years ago Mr. George Paul crossed *R. Fortunei* with a selection of garden sorts such as Blandianum, Jas. M. Brooke, Lady Armstrong, and Lady Emily Peel. From these he obtained a race of seedlings with decidedly beautiful flowers, ranging in colour from white to rosy red blotched with maroon, red, yellow, or emerald green. The trusses are almost as compact as in *Broughtonii*, or loose after the manner of *R. Fortunei*; many of them are fragrant and all are quite hardy. Their only defect is that of flowering too early to escape late spring frosts. In the South and West they will no doubt prove of the greatest value. Four of these hybrids have received First-Class Certificates, namely, Duke of York, Duchess of York, Mrs. Thiselton-Dyer, and Profusion.

Another well-marked, superb hybrid is *Luscombei*, raised about 1875 by Mr. T. Luscombe, from *R. Fortunei*

and *R. Thomsonii*. It forms a large shrub of sturdy habit, and is very free flowering, with loose heads of large, bell-shaped, rosy-red flowers. A darker-flowered variety of it, known as *splendens*, first bloomed in Mr. Godman's collection about fifteen years ago ; a second form, with rosy-lilac flowers, is *Luscombei* II.

No good results have been obtained so far by using as breeders the large-flowered *R. Falconeri* and *R. eximium*. Mr. Anderson Henry raised a hybrid between *R. Dalhousiæ* and *R. formosum* which was named *Henryanum*. The beautiful Countess of Haddington is a hybrid between *R. Dalhousiæ* and *R. ciliatum*, and *Victorianum* is a hybrid between *R. Dalhousiæ* and *R. Nuttallii*. Enough is known of *R. Dalhousiæ* to justify the belief that it would breed good garden Rhododendrons. We have already the Countess race raised by crossing *R. Dalhousiæ* with *R. formosum*, and it would be worth while to cross *R. Dalhousiæ* with some of the most likely species amongst the new introductions from China. The possibilities in this direction are endless. We know that the species in the several sections interbreed freely, and we are only now beginning to realise that a judicious blending of their characters by cross-breeding would greatly enrich the Rhododendron garden.

A history of garden Rhododendrons must pay tribute to the work of the Waterers, namely, Anthony Waterer, of Knap Hill Nursery, and John Waterer, of the American Nursery, Bagshot. In these two nurseries many of the best of the *R. catawbiense* type have been raised. Professor Sargent, writing of garden Rhododendrons in America, stated that in the United States, on the Continent, wherever Rhododendrons can be grown, there were the name and fame of Anthony Waterer established. So long ago

as 1832 we read of a hybrid raised by him between *R. arboreum* and *R. caucasicum*, whilst hundreds of Azaleas even at that time owed their origin to him. Since then not a year has passed without the introduction of new varieties ; whilst so high was his standard that the new introductions were certain to be improvements. A new race of Azaleas was raised by him from the Californian *Rhododendron occidentale* only a few years since. In many cases a particular variety which had won the commendation of the experts was not allowed to get into commerce, either because it did not satisfy the exacting requirements of the raiser, or because he had still better in reserve.

Messrs. John Waterer & Sons, of the famous Bagshot Nurseries, state that ever since they started breeding Rhododendrons it has been their aim to produce only seedlings of first-class quality, sufficiently hardy to stand without protection in the United Kingdom. The history of their early hybrids, which were raised by crossing *R. arboreum* and various other species, is now generally known. Of late years they have been introducing into the race thus originated the blood of other species, such as *R. Griffithianum* and *R. Fortunei* in the second generation, avoiding the types or true species lest the plants bred from them should prove tender. Broadly speaking, they have confined their efforts to crossing hybrids, except in the case of such species as *R. catawbiense*, *R. maximum*, *R. Meternichii*, and *R. Smirnowii*, which are absolutely hardy. Some of the best of their later seedlings are Pink Pearl, Alice, Gomer Waterer, Lady Clementina Walsh, and Mrs. Stirling. In none of these is there a direct strain of *R. Griffithianum* or of any other tender species.

Amongst the most successful trade breeders in the

first half of the nineteenth century were Messrs. Standish and Noble, of Bagshot, Surrey. They contributed to *The Journal of the Horticultural Society* for 1850 what is called a chapter in the history of hybrid Rhododendrons, which is of sufficient interest to be reproduced here :—

“Every lover of flowers is charmed with the appearance of *R. arboreum*. Its symmetrical trusses of the richest crimson are objects which attract the most ordinary observer, and the connoisseur amongst plants is equally delighted with them. But on account of the protection of a conservatory being necessary during a considerable portion of the year to ensure the production of these beauties, comparatively few who possess gardens can enjoy this fine plant in perfection. From this circumstance an early desire evinced itself in the gardening community to produce hybrids between it and the hardy American kinds, but the results of such crosses, although much was accomplished, were not of a satisfactory nature. It is true many beautiful hybrids were produced, among which we may mention *Russellianum* and *Altaclarensis*, presenting a richness of colour almost equal to their Indian parent, but they did not inherit sufficiently the hardy constitution of the Americans. Their tendency to bloom so early in the year, generally from the latter part of February to that of April, invariably exposed them to cutting winds and severe frosts. The length of time required to bring them into a blooming condition was a severe tax upon the patience of the cultivator, from ten to twelve years and even twenty years elapsing before the anxious eye has been gratified with a flower ; and often, when the production of flower-buds had been effected, and the promise of abundant bloom was about to be realised, an unfavourable season has frustrated all hopes of seeing the flowers anything like

perfection, if at all. At Highclere, the seat of the Earl of Carnarvon, are large masses of *Altaclarensis* and *Russellianum*, 10 to 12 feet in height, which for the last two seasons were well covered with flower-buds. Had the weather been favourable they would have formed magnificent objects ; but unfortunately this was not the case, and the whole were completely destroyed by frosts.

“Knowing that the many disappointments of this character were exercising a retrograde movement in the taste for hybrid *Rhododendrons* as they were then constituted, about twelve years ago we commenced a series of ‘crossings,’ with the view of remedying the great defects so apparent in the earliness of blooming and susceptibility to frost. In this we have been perfectly successful. By crossing the American species again with the first hybrids, such as *Altaclarensis*, &c., we have still retained the rich tints of the Indian kinds, with all the hardiness of the American ; and what is of equal import, the results of such crossings are the production of varieties which have a tendency to bloom in a very young and dwarf state, and sufficiently late in the season to escape spring frosts, producing their flowers from the middle of May till the latter part of June.

“As so little is known in connection with the nature and effect of hybridising amongst plants, we shall take this opportunity of endeavouring to describe, with reference to the *Rhododendron*, some of the peculiarities which a very extended practice has presented to us. We find that, analogous to what is observed in the animal kingdom, the wider the cross the more healthy the progeny, and that breeding ‘in and in’ produces weak and deteriorated constitutions. We have a remarkable instance of this in a batch of hybrids raised from *R. caucasicum album* (that being a hybrid), fertilised by its own pollen. The plants

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are extremely dwarf with variegated foliage. So dwarf are they that many of them bore eight or ten flower-buds when only from 4 to 6 inches high and four years old. Flowers produced by these dwarfs were again fertilised by their own pollen, and although seeds were produced and these germinated, the plants could not be kept alive, but after various durations of existence, from two to eighteen months, they finally disappeared. One of the dwarfs above named, which we have called Bride, fertilised with the pollen from another distinct hybrid, has, however, produced some very healthy seedlings. A remarkable example of the varied nature which hybridising effects in the Rhododendron is afforded in a hybrid raised from *R. catawbiense* and a large yellow Ghent Azalea. The object was to raise a hardy yellow hybrid, but in this we have been disappointed as it has proved to be pink, and we have named it Deception. It is an extraordinary hybrid; we never recollect meeting with so decided a 'sport.' It resembles neither of its parents, being one of our best growers, with foliage large and thick, of a bright green, and when in a young state it has the appearance of being coated with varnish. Another remarkable sport is a hybrid which we have called Towardii, raised from *R. catawbiense* by Altacolarensis, being a perfect giant in every respect. The foliage is very fine, and the flowers, both individually and in the truss, remarkably large, each forming a perfect cup. We know no Rhododendron equal to it in size and perfection of flowers.

"Having shown some of the effects of hybridising upon the Rhododendron, and the various breeds produced, we would beg to recommend all who intend practising this very interesting branch of horticulture, no matter what class of

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plants they propose to operate on, to choose the parents, whether species or hybrids, as far removed from each other as is consistent with the constitution of the plants and the result aimed at. We have in a tabular form appended a description of eight distinct sections of hybrid Rhododendrons, and it will be seen that all our third crosses, although all hybrids, have been selected as distinct from each other as possible. The plants raised from these crosses are all as healthy as we could wish, and they present a very great diversity in the characters of their foliage."

SECTION I

<i>R. catawbiense</i>	} Altaclarens.	<i>Catawbiense</i>	{	Blandyanum.
<i>R. arboreum</i>		Altaclarens		Towardii.
				Meteor.
				Elegans.
				Nobleanum bicolor.
				Pulchellum.

SECTION II

<i>R. ponticum</i>	} Hybrid maximum.	Hybrid maximum	{	Standishii.
<i>R. maximum</i>		Altaclarens		Mrs. Loudon.
				Picturatum.
				Vivid.
				Captivation.
				Racenum.

SECTION III

<i>R. ponticum album</i>	} Caucasicum	Caucasicum album	{	Bride.
<i>R. caucasicum</i>		album.		Original, and a
			{	race of re-
		fertilised by its		markable
		own pollen		dwarf and
				variegated
				varieties.

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SECTION IV

Purpureum } Queen Victoria.
Altaclarensis }

SECTION V

caucasicum } Coriaceum.
Arboreum album }

SECTION VI

Catawbiense . . . }
Large Yellow Ghent } Deception.
Azalea . . . }

SECTION VII

campanulatum } Hybrid Cam-
Hybrid maximum } panulatum.

The second half of the nineteenth century saw a development of the *Rhododendron* along certain lines. There was plenty of good material available for breeding, but the species were set aside in favour of the hybrids and crosses that had resulted from the operations of the earlier breeders. The principal workers in this field were the Waterers, Standish and Noble, Veitch, Cunningham, Dickson, and Lee, and every year brought a number of new seedlings which generally were advances on the earlier sorts. Their aim was to raise plants that were hardy, sturdy and shapely in growth, so that when not in flower they were good-looking shrubs, whilst the flower-heads, to satisfy the requirements of the time, were to be large and full, the flowers holding themselves up, of good substance, the colours pleasing, and, most important of all, they were not to expand before June. All these requirements were obtained in more or less degree, for we have now a considerable number of garden *Rhododendrons* in which they are in evidence. It is doubtful if this section of the family can be further improved, and breeders themselves admit that the plants that were raised twenty years ago were as good as any that have been raised since. Changes, of course, there have been, and will continue to be, but they are not necessarily advances.

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By the introduction of fresh blood from other species, the chances of something new and superior are improved. This is shown in the origin of Pink Pearl, without doubt the loveliest of all hardy Rhododendrons. Its raiser admits that the Himalayan *R. Griffithianum*, which has large, blush-white, very fragrant flowers, was concerned in its production. In the same way *R. Fortunei*, when crossed with the garden Rhododendrons, resulted in the pink-flowered race that we owe to Messrs. G. Paul & Sons, also the charming Princess Juliana raised in Holland. These are indications of what may be expected when breeders turn their attention to other species.

Selections of the best varieties in the different colours are not easily made from the large number of really good sorts that have claims to favour. There is also the question of constitution, some Rhododendrons doing better than others in a given set of conditions, whilst they may be less satisfactory where the conditions are not quite the same. As a help, however, a select dozen in each of six colour divisions is given here :—

White

Album elegans.	Mme. Carvalho.	Mrs. J. Waterer.
Baroness H. Schröder.	Minnie.	Mrs. T. Agnew.
Fair Helen.	Memoir.	The Queen.
Geo. Hardy.	Mrs. J. Clutton.	Snowflake.

Blush Pink

Concessum.	Rosabel.	Mrs. E. C. Stirling.
Lady Gray Egerton.	Surprise.	Mrs. W. Agnew.
Mrs. W. Watson.	Gomer Waterer.	Princess Hortense.
Pink Pearl.	Lady Moseley.	Strategist.

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Rose Pink

Garibaldi.	Mrs. Chas. Sargent.	Titian.
Kate Waterer.	Mrs. J. Kelk.	W. E. Gladstone.
Lady Armstrong.	Mrs. J. Waterer.	Broughtonii.
Lady C. Mitford.	Mrs. R. S. Holford.	Lady E. Cuthbert.

Red

Chas. Bagley.	E. S. Rand.	F. D. Godman.
C. S. Sargent.	F. G. Waterer.	John Waterer.
Lord Palmerston.	A. B. Mitford.	Duchess of Bedford.
Doncaster.	Caractacus.	John Walter.

Purple

Baron Schröder.	Melton.	Sefton.
Everestianum.	Old Port.	Sylvia.
G. B. Simpson.	Othello.	Fastuosum.
Jas. Nasmyth.	Purpleum Elegans.	Nero.

Bicolour

Marchioness of Lans-	Sappho.	Helen Waterer.
downe.	Maggie Heywood.	Jas. Mason.
Mrs. Heneage.	Mrs. A. Walter.	Lady C. Walsh.
Mrs. R. G. Shaw.	Mrs. J. Penn.	Lady Grenville.
Jas. Mason.		

Another list of value in the selection of Rhododendrons for cold districts is one made by American growers who experience a difficulty with many kinds because of the severity of their winters. What they call the hardiest or the "Ironclad" set, because they thrive in the vicinity of Boston, are the following :—Album Elegans, Album grandiflorum, Atrosanguineum, Caractacus, Chas. Bagley, Chas. Dickens, Delicatissimum, Everestianum, giganteum, Hannibal, H. H. Hunnewell, Jas. Bateman, Lady Armstrong,

PLATE IV
FASTUOSUM FLORE PLENUM



Lee's Purple, Old Port, Purpureum, Purpureum Grandiflorum, and Roseum Elegans. To these may be added Mrs. C. S. Sargent, F. L. Ames, Mrs. Simpson, Mrs. R. S. Holford, Sappho, Martin H. Sutton, H. W. Sargent, and Lady Gray Egerton.

In the selection of varieties able to withstand severe winters the experiments conducted for many years by Messrs. Seidel, Dresden, are of value. Their Rhododendron nursery is in and around a pine forest where the conditions with regard to frost are often severe. The effect of the pine trees is to protect the plants from excess of sunshine in summer, and from cutting winds in winter. The varieties recommended as hardy in most parts of Germany are, according to Messrs. Seidel, the following :—

Hardy in Germany

Boule de Neige.	Frau Rosalie Seidel.	Kate Waterer.
Caractacus.	Frieda von Soden.	Mad. Carvalho.
<i>Catawbiense</i> .	Gloria Gandavensis.	Michael Waterer
Charles Vuylsteke.	Hercules.	Mont Blanc.
Cunningham's White.	James M. Brooks.	Smirnowii.
Everestianum.	Jay Gould.	Viola.

Late-flowering Varieties

Crown Prince.	Lady Tankerville.	Mrs. Kirschner.
Concessum.	Lady de Trafford.	Mde. Carvalho.
Chas. S. Sargent.	Maximum album.	Minnie.
Hannibal.	Maximum roseum.	Sefton.
Ingramii.	Maximum Wellsia-	Snowflake.
John Spencer.	num.	Sunshine.
John Waterer.	Mrs. J. Kelk.	Sir J. Whitworth.
Kate Waterer.	Mrs. Mudd.	Warrior.
Lady C. Mitford.		

CROSS-FERTILISATION

The flowers of Rhododendrons are simple in structure. The calyx is five-lobed, the size of the lobes varying in the different species, being in some cases almost leaf-like. The corolla is usually bell- or funnel-shaped, with five or more lobes. There are, as a rule, ten stamens, sometimes five (*Azalea*), and they have long, hairy filaments and oblong, two-celled anthers which open at the top. The pollen grains are very small, and are held together by a spider's-web-like substance, termed viscin, so that when they are touched by an insect or other agency, the whole mass is drawn out, and hangs together. The style is club-shaped; the stigma is flat-headed, and it is sticky when in a receptive condition.

Rhododendrons are protandrous, that is, the pollen is ready before the stigma. To prevent self-fertilisation, therefore, it is necessary to remove the anthers before they are ripe. In nature the flowers are fertilised by insects attracted by the honey secreted at the base of the corolla, and in their efforts to reach it their bodies become smeared with the pollen, which is then conveyed to another flower; the stigma is situated so that it must come in contact with the pollen adhering to the insect's body, and thus pollination is effected. If the conditions are favourable the pollen immediately begins to swell and develop a unicellular protoplasmic filament, called the pollen tube, which grows down the style until it comes into contact with the ovule or oosphere and fertilises it. The flower then fades, the ovary (seed-vessel) remaining and increasing in size until, at maturity, it turns brown and bursts open to allow the seeds to escape. The seeds are very small, a single capsule if properly fertilised containing several thousands. From the

time of fertilisation to the ripening of the seeds a period of from four to six months elapses. The seeds fall to the ground and germinate in about two months (see chapter on Propagation).

It will be seen that to effect a cross between two different varieties or species of *Rhododendron*, it is necessary to remove the pollen early from the prospective mother flower, and to supply pollen from the male flower when the stigma is in a sticky condition, protecting it from mishap by enclosing the whole flower in a muslin bag. Under glass this precaution may not be necessary. The date of crossing and the names of the two parents should be recorded in a book, and a number attached to the flower to prevent error. Pollination should be effected in the morning of a sunny day.

With regard to the selection of breeder plants, a little forethought is advisable. Extremes are to be avoided, partly because they are not so likely to cross well, but chiefly because their progeny is almost certain to lack quality. The best results are obtained when closely allied species are hybridised. Thus one of the very finest hybrids raised is *Loderi*, from *R. Griffithianum*, and *R. Fortunei*, two closely allied species ; another is *Fosterianum*, from *R. Edgeworthii* and *R. Veitchii* ; a third being *Shilsonii*, from *R. barbatum* and *R. Thomsonii*. Some interesting information on *Rhododendron* hybridisation by the late H. J. Mangles was published in the *Gardeners' Chronicle*, Aug. 2, 1879, p. 136. He tried to cross a large number of species, but met with many failures through ignoring the fact that species that do not show in their general character any affinity will not hybridise satisfactorily.

CHAPTER V

FAMOUS COLLECTIONS

THERE are many large collections of Rhododendrons in the United Kingdom, some remarkable chiefly for the number of interesting species and varieties they contain ; others for their wealth of select garden forms ; others, again, on account of the exceptional vigour, amounting almost to excessive fatness, of the plants ; and still others in which interest, variety, and exuberant health are all combined.

Among national collections, Kew of course is an easy first. Most of the species are in cultivation there, not all of them, however, in the best of health ; still, the variety of conditions provided at Kew afford exceptional opportunities for the successful cultivation of almost all the Rhododendrons. Those that are not represented at Kew are not known to be in cultivation anywhere else. There are Rhododendrons in the Philippines, a dozen species at least, and as many more have been recently discovered in New Guinea. Some of these are evidently well worth introducing as garden plants, but they are not obtainable at present. The Chinese treasures, thanks to intelligent collectors, are being introduced into cultivation almost as fast as they are discovered.

The Azalea Garden at Kew is in June one of the most lovely floral displays to be seen anywhere ; nor are there many better exhibitions of the hardy evergreen Rhododendrons than is to be seen every summer in the Rhododendron dell,

most of the huge bushes being at their best in June. There is also a good collection of Rhododendrons in the Edinburgh Botanic Gardens. The soil at Glasnevin does not suit them.

The nurseries in which Rhododendrons are made much of—namely, those of A. Waterer, Knap Hill ; J. Waterer and Sons, Bagshot ; J. Veitch and Sons, Coombe ; Dickson, Edinburgh ; G. Paul and Sons, Cheshunt ; and R. Gill and Sons, Penryn—are the sources of nearly all the good garden Rhododendrons, species as well as hybrids, for it is their business to introduce and breed them, as it is to encourage others to admire and grow them. A visit to Knap Hill in June, where there are about sixty acres of Rhododendrons, many of them enormous bushes, the progenitors of thousands and thousands of young plants, affords, when they are in full flower, a feast for any one who can admire floral display. Here and at Bagshot there are countless seedlings, from yearlings upwards, being nursed along in the hope that amongst them there will be here and there one worth perpetuating. An inspection of these seedlings is instructive to any one interested in the breeding of plants. Messrs. J. Veitch and Sons have done more than any firm to obtain the Chinese species for British gardens, and we owe to them entirely the beautiful Javanese race bred from plants introduced by their collectors from the East Indies.

Of noteworthy private collections the number is considerable. It is not easy to say which should be placed first. South-west Cornwall is the head-quarters of the tenderer Himalayan species. At Tregothnan, Tremough, Tresco, Penjerrick, Bosahan, Heligan, Scorrier, Wellington Park, and Trewidden, Rhododendrons grow with astonishing vigour ; it has even been said that they grow better there than in the Himalayas. Suitable soil, a moist atmosphere,

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a mild winter, and rarely excessive sunshine in summer, characteristic of this part of Cornwall, are ideal conditions for these Rhododendrons. Many of them seed freely, and the seedlings germinate in the shade of their parents. There one may see *R. arboreum*, *R. Falconeri*, *R. barbatum*, *R. campanulatum*, *R. grande*, *R. Thomsonii*, *R. Griffithianum*, *R. Maddenii*, *R. campylocarpum*, *R. cinnabarinum*, *R. ciliatum*, *R. triflorum*, and *R. niveum*, not as moderate-sized bushes, as one sees them where they require more or less protection, but as great masses of stems and healthy foliage, and when in flower many of them are canopies of bloom. In other parts of the country there are also fine collections. One of the best is that of Sir Edmund Loder, at Leonardslee, where the conditions are evidently exceptionally favourable for Rhododendrons, and the proprietor is a most enthusiastic collector and cultivator of them. Close by is Mr. Godman's fine garden at South Lodge, where Rhododendrons are a special feature. The home of the late H. J. Mangles, who did more than any one to popularise Rhododendrons, and who collected in his garden at Haslemere all the species that he could procure, so that he might study and breed from them, still remains a great Rhododendron garden. A few miles away, at Littleworth, his sister, Miss Mangles, devotes much space to an exceptionally rich collection, in which many of the Haslemere hybrids can also be seen. Sir John Llewellyn, Bt., Penllergaer, in South Wales, has one of the largest and best grown collections in England, and Sir John is an authority on all that concerns Rhododendrons.

In Ireland there are at least two famous collections, one at Killmacurragh, where the late Sir Thomas Acton collected and grew many of the best of the Himalayan species and

first hybrids, the plants equalling in health and vigour those in the Cornish gardens. Castlewellan, made famous by the late Lord Annesley, contains a very large number of Rhododendrons, many of them beautiful examples of cultivation and proofs that the soil and climate of the district are what Rhododendrons like ; for no plants are more difficult to keep in health if these conditions are lacking, nor do any plants give less trouble or respond more readily to ordinary care than Rhododendrons do when the conditions are favourable.

At Singleton, near Swansea, there is a good collection of Himalayan species and many of the best hybrid and garden seedlings. The species are said to have been raised from seeds collected in the Himalayas by Colonel Sykes, who sent them to the Director of the Edinburgh Botanic Garden, who shared them with Sir Hussey Vivian, afterwards Lord Swansea. Some of the specimens are of exceptional size : *R. Thomsonii*, 20 feet high ; *R. barbatum*, 33 feet ; *R. Hodgsonii*, a magnificent bush, 12 feet ; and *R. Falconeri*, 30 feet, the trunk 3 feet in girth and the head 18 feet through. The height of these specimens is partly due to their having been planted in a valley under the shade of tall trees.

The collections mentioned must only be considered representative. There are many others ; some of them, no doubt, quite as worthy as any of those mentioned here. One of the best collections of the *catawbiense* race is that at the residence of the late Baron Sir Henry Schröder, The Dell, Egham, Surrey.

CHAPTER VI

CULTIVATION

THE treatment of Rhododendrons must vary somewhat according to the conditions or the place where they are grown. Mr. H. J. Mangles believed in planting the Himalayan species in borders, even where they are grown under glass, as they are then less likely to suffer through getting dry at the root than when they are in pots or tubs. Like many other Ericaceæ—Cape Heaths, for example—dryness at the root is apt to seriously affect the health of all Rhododendrons. In conservatories and greenhouses where there are no borders, pot cultivation is often successful, but close attention must be given to watering. Mangles held that when the sun shines strongly against a pot containing a Rhododendron, the roots perish and the soil turns sour so that new roots will not go into it; the same result being produced by drought, even in a few hours, whilst water adds to the mischief, rendering the soil more and more sour and unfit for roots. "I have always borne in mind," he said, "that the Sikkim Rhododendrons are for the most part really alpinæ, which require coolness at the roots and as much open air as possible, but which will not endure the inequalities of our climate. I am no believer in starving for bloom in the case of Rhododendrons. Mr. Otto Forster, who, by the way, was the first to bloom *R. Nuttallii* in Europe, agrees with me, and has recently expressed him-

self in emphatic terms. The profusion in which he has bloomed this and other species when planted out, proved that starving is not necessary, nor is it worth resorting to in any case. Poor, stunted blossoms and small, uncharacteristic leaves are not worth the growing.

“At certain periods of their growth Rhododendrons will imbibe an extraordinary amount of water, and in my opinion copious watering is seldom inopportune, provided only that the soil is sweet and suitable. The large supply of water required is well explained by the habit of many of the species to produce large quantities of succulent flowers and gross shoots. It may be objected that copious watering induces robust growth and destroys the prospect of blossom, and undoubtedly this is sometimes the case. When the temperature in the winter and early spring is allowed to range higher by night than by day, it induces pallid and sickly growth, which the chill blasts, admitted in the daytime, make short work of.”

Troubles of this kind are not experienced when Rhododendrons are planted in the open air. Provided the soil is of the right quality and the supply of moisture is ample, they may be classed with those blessings among garden plants which are said to look after themselves ; but seed-pods should never be allowed to form upon the plants, as these have a very weakening effect. They may be transplanted at any time between the 1st October and the 31st May. Their close, fibrous root-system favours transplantation, so that one need not hesitate to move specimens of the largest size, as is, in fact, often done, and with ordinary care the plants do not perceptibly suffer.

When the Himalayan house at Kew was built, a number of very large Rhododendrons were presented for it by Mr.

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Henry Shilson, from his grand collection in Tremough Garden, Penryn, Cornwall. Some of them were trees twenty feet high, with trunks nearly a foot in diameter. They were lifted from the open border, the balls of roots and soil were strongly boxed up, and they were brought by rail to Kew, where they may now be seen, having scarcely felt the change from their Cornish home to the Himalayan section of the great Temperate House. It is important that the roots should not be allowed to get dry during the operation, and after transplanting it is always wise to give the soil about them a good saturating with water. This is all, and, provided the other conditions are suitable, no *Rhododendron* will look behind it if this is done.

Mr. R. Gill, who has had charge of Tremough Garden for many years, and whose success in the cultivation of Himalayan *Rhododendrons* is well known, writing in the *Gardeners' Chronicle* a few years ago, stated with regard to planting: "The mode of planting out which I have followed for nearly thirty years is to set the plants in specially prepared pits, and to surround the ball of roots with a lining of peat and sand, to which I frequently add one-third of decayed leaf-mould. A surface dressing is given as occasion may require. A good mulch of dead leaves—Nature's own method of manuring—is a wonderful help in keeping the roots moist and cool, but in kept beds and borders this cannot at all times be carried out, because of the untidy appearance it gives. In such cases peat or fully decayed leaves must be resorted to as a surface dressing. In the application of top-dressing and in cleansing operations the hoe and spade must be used with extreme caution. The best roots of the *Rhododendron* are near the surface, and to injure these is to damage the plant."

The question of the hardiness of the Himalayan species is a somewhat difficult one. In Cornwall and other favoured parts of the Kingdom they are all quite happy in the open air, but in those parts where frost of from 12 to 20 degrees sometimes occurs, only a few of them can be grown permanently outside. The hardiest are the least interesting, namely, *R. glaucum*, *R. lepidotum*, *R. nivale*, and *R. anthopogon*, all low-growing bushes with comparatively small flowers. Next in hardiness come *R. niveum*, *R. campanulatum*, *R. fulgens*, *R. campylocarpum*, *R. Thomsonii*, *R. barbatum*, and *R. cinnabarinum* (Roylei). These all grow well and flower freely outside at Kew, and are therefore suitable for those parts of the Kingdom where the temperature approximates to that of the London district. *R. arboreum* lives outside at Kew but rarely flowers, whilst the large-growing, big-flowered species, such as *R. grande* (argenteum), *R. Hodgsonii*, *R. Falconeri*, *R. Griffithianum*, *R. Dalhousiæ*, *R. Edgeworthii*, *R. Nuttallii*, and some others, require the humid, mild climate of such districts as South-West Cornwall. The yellow-flowered *R. Wightii*, judging from the altitude at which it is found in the Himalayas, ought to be as hardy as *R. campanulatum*, but it does not appear to have been tested in England, though there are plenty of young plants of it in cultivation now.

At Valewood, Haslemere, a screen house provided shelter for the Himalayan species, but some of these have since proved to be quite hardy there. Hardiness as applied to plants is an elastic term which is often used in a way that misleads. A plant may be able to withstand a certain degree of cold, and yet suffer injury in winter from some other cause. For example, *R. fulgens* is quite hardy at Kew. There are big bushes of it, at least thirty years old, in

the Dell there. They are quite healthy and make good growth annually, but as the flowers expand early in the year, they are therefore often spoiled by a comparatively slight frost. In a way this plant is hardy, yet for garden purposes it must be classed with those that require protection. In the same way *R. ciliatum* is hardy enough at Kew, but its flowers are generally spoiled by frost. In Cornwall it is as happy and floriferous as any plant could be.

The shelter afforded by a belt of trees on the east and north is a great help to these Rhododendrons—in fact, the majority of garden sorts succeed best when they have partial shade and shelter ; at any rate this applies to all the Himalayan species and those hybrids and seedlings which have Himalayan blood in them. An ideal place for them is the Dell at Kew, a long, winding walk with grass banks rising on both sides, flanked by deciduous trees. Here they are sheltered from cold, cutting winds in spring, a certain amount of shade from bright sunshine is afforded, and the air is always fairly moist, partly owing to the situation being low and close to the river, the trees also doing their share in keeping off drying winds. Rhododendrons may frequently be seen thriving in open, somewhat exposed situations, such, for example, as the Knap Hill Nursery, which lies low and is almost a swamp in places, the soil being black, sandy peat ; consequently the atmosphere is always charged with moisture, and this is a prime factor in providing Rhododendrons with what they most require.

What has been said with respect to the treatment of Himalayan Rhododendrons applies also to those hybrids and seedlings bred from *R. catawbiense*, *R. ponticum*, *R.*

caucasicum, *R. maximum*, *R. arboreum*, and others. They all enjoy a sweet, moist soil, a situation where there is some shelter, and, if it can be provided, just that amount of shade that will break the fierce sunshine of summer. Many of them are hardy as gorse so far as temperature is concerned, but they do not all flower sufficiently late to escape frosts in May. Breeders, understanding this, have generally aimed at lateness of flowering. The late Mr. Anthony Waterer refused to recognise as a good garden Rhododendron any seedling that was not of strong constitution, large and bold in foliage, compact and conical in flower-head, not easily injured by wind or rain, and that did not open its flowers before June. Such a standard, although excellent, would shut out some of the most charming sorts, and we cannot afford to give up a plant that produces beautiful blooms in May or earlier, even although they may now and then be spoiled by frost.

SOIL

However much lime may promote soil fertility, it is quite certain that soils which contain lime in any appreciable quantity are unsuitable for Rhododendrons and Ericaceæ generally. Peat is the ideal soil for these plants. But the term peat, like that of loam, is applied to soils most diverse in character. Some peats are so close and acid that no plant will grow in them. Such are the peats of bog land; yet even these, if drained, broken up, and exposed to the influence of air and frost, become suitable for peat-loving plants at any rate. The light, sandy peat that often occurs in the heaths and moorlands of this country is the best soil for Rhododendrons; but it is often poor, and requires the addition of humus in the form of decayed

leaves or stable manure. What is known as barren, unreclaimed heath land in some parts of Surrey, has a soil which consists almost entirely of very fine sand from which chalk is entirely absent, but it is comparatively rich in humus. Such is the soil of Haslemere and the surrounding district, where heather and pine flourish. The Rhododendron gardens that have been formed on this soil are a proof that it suits them.

Rhododendrons have a close, finely fibrous root-system. They are surface rooters ; the roots never extending far, nor descending lower than a foot. A soil to suit them must be one that is sweet as opposed to sour, must retain moisture for a reasonable time, and resist drought. Such a soil is generally rich in humus. It is not the chemical composition of the soil so much as its mechanical texture which decides whether it is suited to any particular plant. Fertility is not a question of chemistry so much as one of physical properties. A soil that is quickly responsive to freshly applied manure is often the best from the cultivator's point of view ; and it is certainly most easily controlled.

In their native homes many Rhododendrons are epiphytes. They therefore obtain nourishment entirely from water plus the little humus that is contained in the débris which accumulates about their roots. It is quite certain that water in which there is no lime supplies nearly everything that a Rhododendron requires. In this respect the plants resemble Orchids, and the experience of cultivators supports the belief that Rhododendrons, like Orchids, obtain pretty well all they require from water. It is difficult to say why the presence of lime, either in the water or the soil, should have such ill effects on the health of Rhododendrons and Orchids.

VARIOUS KINDS OF SOIL 55

Although peat of a certain quality is the ideal soil for Rhododendrons, other kinds of soil suit them to a greater or less degree. The soil in South-West Cornwall, where Rhododendrons grow so well, is decomposed granite rich in humus. It contains no lime, and it retains moisture without ever becoming stagnant. At Kew the natural soil is a light, sandy loam, containing scarcely any lime ; consequently Rhododendrons, provided they are not allowed to suffer from drought—which they certainly would do in the summer unless they were frequently watered—root and flourish very well there. Once upon a time it was believed that they would not grow at Kew unless they were planted in peat, which was procured from Ringwood or Bagshot. The Himalayan House, when it was first made, contained borders of Ringwood peat for the Rhododendrons, but they did not flourish in it, and experience having meanwhile demonstrated that the natural soil of Kew agreed with these plants outside, the borders in the house were remade with this soil, the result being a considerable improvement in the health of the Rhododendrons. The moral of this is—first be certain that the home soil is unsuitable before going to the expense of purchasing special soil for the plants.

Rhododendrons, therefore, will grow in any soil that does not contain lime, is porous without being dry, and is fairly rich in humus. Even absolute sand, if enriched by adding leaf-soil or well-rotted manure, is suitable, and some loams which appear to be heavy have been known to suit them. After all, the proof of the pudding is in the eating ! It is easy to be deceived as to the fertility of a soil. A great deal of nonsense is to be found in books as to what is, and what is not, suitable for certain plants. Chemical analysis is, as a rule, misleading ; what has been termed a mechanical

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analysis, with information derived from men experienced in the cultivation of the soil, is a far safer guide. A soil may be made to meet the requirements of Rhododendrons by draining it or by adding humus in some form ; but it must be non-calcareous. Soils on which the Spanish Chestnut, Birch, Conifers, particularly *Pinus pinaster*, thrive, are not unlikely to suit Rhododendrons. The important points to be remembered are that Rhododendrons are moisture-loving plants, which dislike stagnation at the roots, and are quite happy in any soil that does not contain lime. Annual mulchings of dead leaves or well-rotted manure serve the double purpose of providing nourishment to the roots and preventing the escape of moisture from the soil. When they are cultivated in tubs or pots, there is no difficulty in providing a suitable compost. A mixture of leaf-mould, peat, light loam, and sand suits all the stronger-growing kinds, but the loam should be omitted for Indian Azaleas and the smaller-growing sorts.

Where the soil of a garden or park is not suitable for Rhododendrons, beds formed of fresh soil must be made. The right way to do this is, not to make a hole and fill it with the prepared soil, but to form a mound large enough to accommodate the plants and to retain moisture. Much money has been spent in excavating beds and filling them with a peaty mixture. The Rhododendrons will thrive in this until the lime from the surrounding soil impregnates the bed, and then the plants are bound to suffer. When the soil for the Rhododendrons is placed above the level of the rest, there is little danger of the lime affecting it.

PLATE V

VIEW IN THE AZALEA GARDEN, KEW, IN JUNE



PRUNING AND TRAINING

Rhododendrons grow so close, and their branches are, as a rule, so sturdy, that they do not require to be pruned in the proper sense of the word. It is, however, sometimes desirable that they should be made to assume a particular shape, or kept to some definite height, and then the removal of parts of the branches may be necessary. Few hard-wooded shrubs will bear severe cutting without loss of vigour as Rhododendrons do. Old bushes that have become thin at the base, or too large for their position, may be cut down to any height, even to within a foot or two of the ground; for, however old the wood that is left may be, it soon develops buds which grow into shoots, and in a year or two all evidences of severe cutting disappear.

The right time of the year for cutting down the plants is February. If the branches that are removed are thick, it is advisable to tar the snags over immediately after cutting; and should the weather after the operation be dry, the stumps are assisted in the development of buds by a thorough moistening with a syringe once or twice a day. A good mulch of dead leaves or a mixture of leaves and well-rotted manure should be placed about the plants that have been cut down, as it protects the roots near the surface which otherwise would probably suffer as the result of depriving them of the shelter and shade that the tops afforded.

The position of the flower-heads of nearly all Rhododendrons being terminal on the branches, the development of lateral growths takes place naturally, every flower-head being succeeded by two or three new shoots. Stopping the shoots, therefore, for the purpose of making the plants

bushy, is not required. It may be advisable, for the sake of balance, to remove here and there straggling branches ; still, in a general way, Rhododendrons look best when they are allowed to grow to their natural forms. Indian Azaleas and some of the greenhouse Rhododendrons are sometimes trained and pruned to a standard or pyramidal shape, and recently the Belgian growers have trained them to a screen or fan shape. For this the use of stakes and ties, as well as pinching and pruning, must be resorted to. The standard Azaleas and Rhododendrons are not difficult to make ; nor are the flat-topped, table-like specimens, beloved of the Belgians, the branches of Azaleas generally having a tendency to grow horizontally or in tiers, a habit that makes the production of pyramids a slow and tedious process. At the great exhibitions of thirty or forty years ago there were pyramid Azaleas 8 feet high, and painfully trained, formal objects they were. Such plants are not seen now, but the Belgian growers have revived the art of training pyramid Azaleas, and they are likely to become fashionable again. In every type of Rhododendron, including the tender and hardy species and hybrids, it is a very great gain to the plants if the faded flowers are removed before the seed-pods develop. If a plant flowers abundantly one season and is afterwards permitted to produce seeds, it rarely flowers satisfactorily in the following year.

SEEDS

Rhododendrons, cultivated as well as wild, seed more or less freely. The woody, many-celled capsule contains a very large number of small, flattened seeds, the ends pointed or tailed. They ripen in about three months, and if gathered

and placed in a paper packet and kept dry, they retain their germinating power for several years. For raising stock of species, seeds are by far the best ; but for hybrids and garden varieties they are unreliable, as they do not reproduce the distinguishing characters of their parents. If, however, it is desired to raise new sorts, seeds taken from the best varieties may yield a percentage of good seedlings. This is, of course, the practice of those who breed new Rhododendrons. Cross-fertilisation may improve the chances, although it is often better to use pollen of the same kind, if from a separate plant, than that of another variety. When two distinct plants of hybrid origin are crossed with each other, the progeny is often inferior. Experienced breeders, knowing this, work only with what is called a particular strain, whether it is a domesticated race of plants or of animals. Sufficient attention is not paid to the very important question of purity of strain by breeders of plants ; and, as a consequence, they effect little beyond an increase in the multitude of mongrels of worthless character.

Seeds, then, are only to be used for the propagation of wild or true species of Rhododendrons. They may be sown at any time, preferably in March or April. Pots or pans should be used or prepared in the usual way, the compost most suitable for the seeds being finely-sifted peat and sand in equal proportions, pressed firmly into the pot, well watered, and allowed to drain before the seeds are sown. As with all fine seeds, those of Rhododendron should be scattered evenly over the surface of the soil, and then covered with the thinnest possible layer of fine sand. Each pot should be covered with a pane of glass, and then placed on a shelf in a warm greenhouse where it can be shaded from direct sunshine. The soil must not be allowed to become any-

thing like dry, to prevent which, some gardeners stand the seed-pot in a saucer in which a little water is always kept.

The seeds germinate in a few weeks, the seedlings being at first very minute ; as soon as they can be handled, they should be pricked off in pans or boxes of sandy peat. After a few weeks under the same conditions, the seedlings will be ready to be placed in a close frame, where they should be regularly sprinkled with water and shaded in bright weather. When they are about a year old, they should be large enough to be planted in a nursery bed ; or, if they are choice or tender, planted singly in small pots, although there is an objection to the use of pots for plants at this stage, as the soil in them is likely to get dry. Drought at any stage is almost as bad for *Rhododendrons* as it is for fish. There is less danger in the other extreme of excessive moisture, provided the soil keeps sweet and the plants are not always under water.

Young seedling *Rhododendrons* make rapid progress when they are planted out ; pot treatment is therefore a mistake, unless there is an exceptional reason for it.

Rhododendron ponticum is almost universally used as a stock for the hardy evergreen sorts. For this purpose seedling plants are required. These, in places where the species is common, may often be collected in the neighbourhood of the old plants ; generally, however, they are raised artificially, the seeds being sown in a little warmth in February. The seedlings, when large enough to be handled, are pricked out in pans or shallow boxes of fine, peaty soil, and kept in frames for a few weeks until the end of July, when they are placed in the open, preferably under the shade of a hedge or wall, until the beginning of September. They may then be transplanted in beds in

partial shade, setting them in rows about 3 inches apart, and watering them well in, shading them in bright sunshine. They are all the better for a slight protection in winter, such as that afforded by a loose layer of bracken or spruce branches. Here they may remain till the following September, when they will be large enough to be transplanted to an open bed, setting them about 8 inches apart. In about two years they should be healthy plants with stems as thick as a lead pencil and of the size preferred for grafting.

The age at which seedling *Rhododendrons* may be expected to flower varies from two years to an indefinite time. Sir Joseph Hooker sent home from Sikkim in 1848-9 seeds of many new species. The first of these to flower was *R. ciliatum*, when it was two years old. The volumes of the *Botanical Magazine* for 1855-6-7-8 contain figures of a number of these species which had been prepared from plants raised and flowered for the first time in this country. The ages of some of them were : *R. Falconeri*, *R. cinnabarinum*, *R. Hookeri*, *R. campylocarpum*, seven years ; *R. Thomsonii*, eight years ; *R. Griffithianum*, nine years ; *R. Nuttallii*, eighteen years. Of those more recently introduced from China, *R. ciliicalyx* flowered when it was eleven years old ; *R. Delavayi*, fifteen years ; *R. intricatum*, four years ; *R. racemosum*, four years. From these figures it will be seen that *Rhododendrons* flower when they are from three to eighteen years old. Probably the garden races flower at an earlier age. The Indian *Azaleas* (*R. indicum*) and Swamp Honeysuckles (*R. sinense*) flower at from two to three years.

With regard to seedling hybrids or crosses, the first flowers are not, as a rule, as good in quality as they are when the plant is older. In the case of the former, expert

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breeders select the seedlings that look most promising and graft them on a forcing stock, which has the effect of bringing out in the succeeding flowers their best qualities.

Messrs. Seidel, of Dresden, raise a large number of *Rhododendrons* every year from seeds. The seedlings, when quite young, are planted in the open, to be tested as to their hardiness before they are grown to flowering size. The object of this treatment is to take full advantage of variation in the direction of hardiness, and, as the situation of the nursery where the young plants are tried is exposed and subject to frequent frosts, it is assumed that any seedling which survives this treatment may be considered to be quite hardy.

LAYERS

Layering is sometimes resorted to for *Rhododendrons* which it is desired to grow on their own roots. In the United States the garden *Rhododendrons* when grafted on *R. ponticum* do not thrive as well as the same varieties do when they are from layers. Nurserymen in this country who grow for the American markets, knowing this, layer certain kinds to meet the requirements of American customers. Probably many of the garden *Rhododendrons* would grow and last longer in this country if, instead of being grafted on *R. ponticum*, they were raised from layers or cuttings.

It is not unusual for *Rhododendrons* that have been grafted to lose their health after a time, as many other grafted plants do, in consequence, no doubt, of some defect in the stock. There does not appear to be any good reason why a garden *Rhododendron* should not live to as great an age and keep its health as *R. ponticum*, *R. caucasicum*, and other species do. When they fail, it is probably because

they are not on their own roots. Layering is, of course, slower and more laborious than grafting, otherwise many more garden Rhododendrons would be propagated by the former method. Habit is second nature ; it has become the general practice to graft Rhododendrons, and we keep on doing it because that is the recognised way, and not because it is the best way, assuming that the welfare of the plant is a first consideration.

Rhododendrons, as a rule, are easy to layer, the younger branches being thin, pliant, and horizontal, so that it is not difficult to peg them down. Even large branches, several years old, may be taken. They should be partly cut through and split in the way that other layered shrubs are treated, and when they have been pegged firmly, and the soil placed about the fixed-down portion, nothing more is needed until the layers are well rooted, which usually takes about two years, when they may be cut away from the parent stock, to start on an independent existence. Layering is also practised for select varieties of hardy Azaleas, although it has become general with growers of these plants to resort to grafting, the stocks used being seedling Ghent Azaleas. In this case grafting is less likely to affect unfavourably the age of the plant than when a stock of a different species is used. All the same, layering is to be recommended for the hardy Azaleas, and indeed for all the smaller Rhododendrons of which seeds are not available or cuttings not to be relied upon.

CUTTINGS

Except for the purpose of raising stocks on which to graft *Rhododendron indicum*, and for the multiplication of the Java race, cuttings are rarely resorted to for purposes of propaga-

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tion. There does not appear to be any satisfactory reason why *Rhododendrons* generally should not be as readily propagated in this way as other *Ericaceæ* are. *Erica* itself is difficult, in the case of the hard-wooded Cape species at any rate, but cuttings were, and still are, the only means of increasing them in this country, where seeds very rarely ripen. *Arbutus*, *Pernettya*, *Gaultheria*, *Andromeda*, *Kalmia*, and *Clethra*, all shrubby members of this order, are propagated by means of cuttings. In a paper on hardy *Rhododendrons* by Mr. Rudolf Seidel, Dresden, published in 1902, it is stated that in his nursery large numbers of *Rhododendrons* of the *caucasicum* type, including Cunningham's White, are propagated by cuttings. They are put in in November or December, the soil used being chiefly sand in a frame kept moist and warm by a hot-water bed. By March they are well rooted, when they are potted and hardened off before being planted out in beds in the open.

It is more than likely that the majority of, if not all, *Rhododendrons* are capable of being multiplied from cuttings, and that when once rooted they would thrive at least as well as when grafted. This is true of most *Roses* and fruit, which nevertheless are invariably multiplied by grafting. There is no physiological difference between the several forms of Indian *Azaleas* that are propagated from cuttings to be used as stocks, and the varieties that are grafted upon them. Nor can there be any difference, so far as the capacity to strike root is concerned, between a hybrid *Rhododendron* and a species. Still, *Rhododendrons* generally are not propagated from cuttings.

When *R. racemosum* was introduced from China it was propagated from cuttings, hundreds of plants being thus raised at Kew. The North American *Azaleas* also are

readily propagated from cuttings, whilst all the species and crosses of the *Javanicum* race are multiplied in this way.

Azalea stocks are raised from the soft lateral shoots which develop from the grafted stocks in winter. They are inserted in shallow boxes of sandy soil, placed in shallow frames, heated to a temperature of from 65° to 70° F., and kept moist to saturation point; they root in about four weeks, and are then transplanted into beds or potted singly into thumb pots, and grown in a moist house or frame until the following spring, when they are beheaded and grafted.

Belgian growers have perfected this method of raising Azaleas by the thousand, so that scarcely one per cent. of cuttings or grafts fail. They have low houses, such as we call pits, with propagating frames on both sides, the frames being flat, large squares of glass serving as a covering, and the cuttings on the one side, grafted plants on the other, are all placed as thick as they will stand, their tops almost touching the glass.

In France, bell glasses, placed on shaded borders of light sandy soil in the open air, are used for raising Azalea stocks from cuttings, in much the same way as we raise hardy Heaths. The principle is the same, whether frames in a house or cloches outside are used, the cuttings being kept uniformly moist and the air about them fresh.

The Javanese Rhododendrons are, as has been said, invariably multiplied by cuttings formed of half-ripened shoots and placed in frames in sandy peat soil, where they are kept at a temperature of about 60°. They root freely when thus treated, the thousands of plants which have been raised in the nurseries of Messrs. J. Veitch & Sons having all been raised in this way. Azalea Hexe, a cross

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between *amoëna* and a variety of *indica* known as *Duc de Nassau*, is a pretty little red-flowered plant of extraordinary floriferousness, which is now raised by the Belgian nurserymen in hundreds of thousands by means of cuttings, and sold when quite small for decorative purposes. It is also largely used, both in Belgium and Germany, as a stock on which some of the larger-flowered Indian Azaleas are grafted. The several varieties of *amoëna* which are largely grown as pot plants, and in the warmer parts of the British Islands are increasing in favour as hardy shrubs, are all propagated from cuttings put in in February or March under bell glasses or frames. No doubt such species as *R. intricatum*, which is more or less of the *amoëna* type, may be multiplied from cuttings. At any rate, it would be a mistake not to try this method for them before resorting to grafting.

GRAFTING

The advantages of grafting are in many cases beyond question. It is unnecessary here to discuss the arguments for and against its adoption for the welfare of many garden plants. The cultivation of *Rhododendron indicum* is not only rendered easy by its means, but it has also made the plant important commercially, because the grafted plants are cheap, free flowering, and sturdy. Its beneficial influence in this case is due to the fact that the only difference between stock and scion is a very slight one, for both are of the same species.

With regard to the evergreen Rhododendrons, for which grafting has become an almost universal method of propagation, the number of plants raised from layers being comparatively small, there is a much greater difference in constitutional vigour and hardiness between *R. ponticum*,

the species used as a stock, and many of the varieties which are grafted upon it. There does not appear to be a record of the first employment of the grafting method for this section of Rhododendrons; it was probably turned to account in the propagation of the earliest hybrids raised in this country between the Indian *R. arboreum* and the other hardier species which had previously held the field as garden shrubs. The excitement caused by these hybrids raised at Highclere, Hants, and flowered for the first time over eighty years ago, may have led nurserymen, in their efforts to quickly work up stock of them, to resort to grafting.

Before 1850 grafting had become general, discussions having taken place about that time with respect to its advantages and disadvantages. Thus we read in the *Gardeners' Chronicle* for 1850 that, although grafting was then the means most generally preferred for the increase of new varieties of Rhododendrons, attempts had already been made to prove that the grafted plants were, as a rule, short-lived and unhealthy, and that whilst grafting increased their tendency to flower, it was at the expense of their general vigour. A German writer about the same time insisted that plants from cuttings ought to supersede those from grafts, because the latter, although they grew well for a time, ultimately went wrong through an imperfect union, or some inequality between stock and scion. Then, as now, there was something to be said for this view. It would not be difficult to prove that *R. ponticum* is not a suitable stock for some of the varieties that are grafted upon it. It is certainly unsuitable for the more tender Himalayan species, seedlings of *R. arboreum* or *R. campanulatum* being far better. Nurserymen ought, then, to

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exercise more care in the selection of stocks for Rhododendrons. It is radically wrong to graft a tender species on a hardy one, and to reverse them is equally bad. Attention should always be given to this question of equality in hardiness, and also with respect to stature and habit.

The three modes of grafting preferred for Rhododendrons are those of the wedge, the saddle, and the side. In wedge and saddle, the top of the stock is cut off and a slit is made in which the scion, which is cut in the shape of a wedge, is inserted; or the stock is cut to a wedge point and the scion is split and fixed on, like a saddle.

For side grafting the top is left on the stock, a slice is cut out of the side a few inches below, and the scion is cut so as to fit in this incision, the graft then being bound on with strong grafting cotton, a covering of clay or wax being pressed tightly over it.

The grafted plants are then placed in a frame, where they are kept moist and in a temperature of about 55° until a union has been effected. The top of the stock which has been side-grafted is removed as soon as the scion starts into growth. Either of these three methods will answer for any of the strong-growing sorts. A heated frame is not necessary for hardy sorts. The practice to-day is exactly the same as it was forty years ago, when John Standish, one of the greatest of English Rhododendron breeders and growers, described his method as follows :—

“We begin to graft in January, February, and March, and for a cold frame the operation may even be extended into April, but in that case the grafts should have been taken off by the end of February, and stuck in under a handlight, behind a north wall, or in some other shady place. Those

worked in heat may be grafted either saddle or wedge fashion, but saddle grafting is the best and makes the strongest union. The graft should be not quite so large as the stock, so as to leave enough room to make a good callus. The wedge grafting is for using small bits of choice sorts. We use shallow boxes 1 foot wide, 2 to 3 feet long, and 4 inches deep, packing the plants into them as closely as possible (for when done in this way they are convenient for moving from place to place), and then placing them in a gentle, moist heat, under double glass if possible, though I have seen very good results when they have been placed in shallow pits, where these are heated with a couple of 3-inch pipes along the front. In that case they should be sprinkled or syringed twice a day, and shaded from the sun until they start into growth, when air must be admitted very gradually until they are hardened and fit to stand out in a shady place until October, when they can be planted out. The tender leaves made under glass will not stand summer sun. In April I have seen very good results in a cold pit, and for an amateur where only a few are required they will do very well under a bell glass ; but they must be always attended to as above.

“Another method is to graft in August. This must be side grafting, and the plants so done must be kept under glass all the winter in pots, and should not be headed back until the stocks have begun to grow, when the young growth should be stopped back until the graft begins to shoot ; the stock can then be headed back. Plants done in this way may, after they have made their first growth, be potted in larger pots and placed in a shady place, and they will make fine plants by the autumn.”

The use of *Rhododendron Cunningham's White* as a

stock on which to graft the Indian Azaleas is practised by Messrs. Seidel, the largest growers of Azaleas in Germany, their output annually in 6-inch pots being over 100,000, every one of which is grafted on this Rhododendron. Its fitness as a stock was proved by them before 1894. In that year they exhibited at Ghent a collection of their Azaleas all worked on this Rhododendron, and although they received a certificate of merit for an improved method of growing Indian Azaleas, Belgian growers were sceptical, and indeed to this day they will not admit that a Rhododendron can be as suitable for Azaleas as the stocks they themselves use. There can be no doubt, however, that the Dresden Azaleas are of first-class quality, and whatever there is of reason in the Belgians' objection to the Rhododendron, it certainly answers perfectly at Dresden. Cunningham's White is easily raised from cuttings, and quickly grows into smooth, clean stocks. The cuttings are placed in warm cases in February and March, where they root in about six weeks. They are then potted singly in small pots, and grown on till the following spring, when they are grafted. Whip grafting is preferred, and after the grafts have taken the treatment the plants receive is the same as that given by the Belgian growers.

DISEASES AND PESTS

Rhododendrons are remarkably exempt from fungal and insect troubles. This may be due to their toxic properties, which certainly protect them from the attacks of larger animals. Their leaves become infested with thrips and red spider, when the conditions with respect to moisture and temperature are wrong, and it is even possible for scale insects to attack them when they are

PLATE VI
MADAME CARVALHO



grown in greenhouses with other plants. Azaleas, especially, are apt to become badly infected with thrips, but it is only when the plants are not kept moist enough by the free use of the syringe and watering-can.

The fungi known to trouble *Rhododendrons* are, according to Masee, rust (*Chrysomya rhododendri*), which forms small pustules on the foliage, but is not considered to be very injurious; blight (*Pestalozzia Guepini*), which causes large, irregular blotches on the upper surface of the leaves; and gall fungus (*Exobasidium rhododendri*), which forms fleshy, irregular-shaped galls on the young leaves, but does not appear to affect the health of the plant. Another species, *Exobasidium japonicum*, forms similar galls on Indian Azaleas; they grow to a considerable size, and are like big, fleshy, green warts. Although these galls sometimes occur in great abundance, especially when the season is wet and the temperature unusually irregular, they do not occasion any alarm among the growers.

Rhododendrons of all kinds, including Indian and Ghent Azaleas, are subject to a mysterious disease known to cultivators as canker. It shows its presence by the death of whole branches, and sometimes the entire plant perishes. In Azaleas the stem turns brown at the base, and this is followed by the yellowing and falling of the leaves. Some cultivators attribute the trouble to over-cultivation, some to sunstroke, and others to grafting. The disease is, however, common to *Ericaceæ*, and Cape Heaths sometimes die by hundreds from it. Whatever the cause—and it is probably beyond control—nurserymen know only too well that it is very destructive, and the healthiest-looking plants are often the first to perish.

CHAPTER VII

GHENT AND MOLLIS AZALEAS

THE race of hardy Rhododendrons popularly known as Ghent Azaleas is cultivated in Belgium, Holland, Germany, and in several nurseries in England, particularly Mr. Waterer's, Knap Hill, Surrey, and Messrs. R. & G. Cuthbert's, Southgate, Middlesex. At Knap Hill there are numerous very large bushes of the species, and of course there is the fine collection in the Arboretum at Kew. In the garden they are most effective when planted in masses, their flowers in June being lovely in their varied colours, and they are delightfully fragrant. They resemble other sections of the genus in their objection to lime and in their love of moisture. They are all deciduous, but before the leaves fall they change to rich brown and crimson colours, and they will live and thrive for many years where the conditions are to their liking.

Hundreds of thousands of these Azaleas are forced into flower in early spring, many of them being used for room decoration, a purpose for which they are well adapted if the flowers are first gummed so that they cannot be shaken off. They force quickly into flower, the plants being placed close together in a hot, moist house, and heavily shaded until the flowers expand, when they are exposed to full light to develop the colours. That Ghent Azaleas have been popular in English gardens for many years is evident

from the large number of named varieties that were listed by nurserymen seventy-five years ago.

Their history dates back to 1738, when Peter Collinson, the friend of Linnæus, introduced *R. nudiflorum*, *R. viscosum*, and *R. calendulaceum* from North America. The yellow *R. flavum* (*Azalea pontica*) was not introduced until 1793. According to Loudon, Messrs. Lee and Kennedy were the first to raise hybrids from them in this country. Then followed Osborne, of Fulham, and the Waterers. Loddiges enumerated 107 varieties in his catalogue nearly seventy years ago. Their hybrids were chiefly the result of crossing the American species with *R. flavum*. A baker in Ghent named Mortier also raised many hybrids and seedlings from them. His work was taken up by the Ghent nurserymen, including van Cassel and Verschaffelt, and their plants soon became prime favourites in England, where they were known as Ghent Azaleas. Van Houtte was the first to raise double-flowered varieties.

These Azaleas are now grown in Ghent in enormous quantities for the supply of the English and other markets. One-year-old seedlings are used as stocks for the named varieties, which are grafted as Indian Azaleas are. They make saleable plants in about two years.

R. sinense (*Azalea mollis*) is also very largely grown in Belgium. Van Houtte raised many seedlings, and did much to improve the substance and colour of its flowers. It is of special value for forcing, besides being a first-rate flowering shrub for the open air. This species has also been used as a breeder by Messrs. Koster, Cuthbert, A. Waterer, and others, who have crossed it with various Ghent Azaleas, the result being that the seedlings have gained richness of colour and substance from the Ghent race, and size from

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the *flavum* race. Mr. A. Waterer has also raised a new race by crossing the late-flowering Swamp Honeysuckle, *R. occidentale*, with the Ghent Azaleas, thereby prolonging the season of flowering and adding foliage to the flowers, these plants being in full leaf at the time of flowering.

He also has a very fine strain of the Ghent Azaleas in which the scarlet-flowered varieties are exceptionally good. What are known as mollis-sinensis hybrids must be seedlings of true sinense, if their name means anything; it is, however, probable that, in the production of the seedlings of which the beautiful Anthony Koster is a type, a North American species has been used. M. van. Houtte did much to improve and diversify *R. sinense*, which is also quite hardy in the south of England, flowering profusely towards the end of May. In addition to the grafting method, these plants may be propagated from seeds, or, in the case of named varieties, cuttings formed of half-ripened shoots placed in a little warmth in July.

A few words may appropriately be said here with respect to the forcing of these plants as it is practised by market growers. They are placed in successive batches, beginning in January, in a hot-house, where they are kept in the dark and syringed several times a day. This treatment causes the buds to develop rapidly. When the flowers are fully expanded, they are gummed, that is, a weak solution of gum is placed in an oil can such as is used for oiling a bicycle, and a little of the gum is allowed to run between the calyx and corolla of each flower. Thus treated the flowers keep fresh on the plants for weeks. Before using them for decoration the plants require to be hardened by exposure to light and a lower temperature.

CHAPTER VIII

INDIAN AZALEAS

Rhododendron indicum (*Azalea indica*) was first introduced into Holland from China in 1680, but it appears to have gone out of cultivation long before it was re-introduced in 1830, when a Captain Daniels brought plants of it from China to England. These were purchased by Mr. Knight, a nurseryman in King's Road. There were five varieties, two large-flowered, two reds, and one double red. There is no record of seedlings being raised in Europe until long after this, the many varieties then cultivated in England and elsewhere having been obtained from China, where, according to Fortune, they were largely cultivated in gardens, and where only he was able to find any that he considered worthy of introduction. These Chinese varieties were, however, largely propagated in England, France, and Belgium, mainly by grafting and layering. There were also in cultivation at the beginning of the nineteenth century several natural varieties of *R. indicum*, namely, *macranthum*, *Simsii*, *ledifolium*, *liliflorum*, and *album*. According to Duval, the introduction in 1843 of a variety known as *vittatum* led to the raising of seedlings. Messrs. Knight and Perry, Ivery and Rollison, in England; L. Eeckhaute, J. Vervaene, Haerens, van Houtte, van Geert, A. Verschaffelt, J. de Kneep, and van der Cruyssen in Belgium; Lesebe, Truffaut, H. de May, and Mabire in France; and Schulz,

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E. Liebig, Seidel, and Rose in Germany, were and are the principal breeders of Azaleas in Europe. The variety *amoena* was introduced about 1832 by Fortune, who found it in a nursery near Shanghai. It is probably only a garden sport from *R. indicum*.

The number of varieties of Indian Azaleas is said to run into thousands. All the modern ones have been raised either in Belgium or Germany, where they are cultivated by the million and exported to almost all parts of the world. Something like two and a half million plants are annually exported from Belgium alone. Some of the best varieties are branch sports. Mr. Louis Sander, of the Bruges Nursery, where 100,000 Azaleas are grafted annually, and many thousands of seedlings raised, informs me that most of the recent novelties have been obtained in this way. If a red variety is crossed with a white, the resultant seedlings are either red, white, or variegated, and it is from those with variegated flowers that the best branch sports are obtained. Probably the most successful of modern Azalea breeders is M. Joseph Vervaene, of Ghent, who is now about eighty years of age. He obtained one of the most beautiful Azaleas known, namely, *Vervaeniana* as a branch sport, from an ugly variegated seedling possessed of three valuable qualities, viz.—perfect shape, earliness, and freedom in growth and flower. The white *Vervaeniana alba* is a branch sport of the same character. The number of varieties cultivated in the Bruges Nursery is between five and six hundred. A rough calculation of the new seedlings distributed by the leading raisers during the last ten years shows that about a dozen of first-class promise are added every year. The influence of the American market on the trade in Azaleas is revealed in some of the

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names of the varieties sent out recently ; such as Uncle Tom, How Lovely, My Darling, Daisy Bells, and New York Pearl.

INDIAN AZALEAS IN GHENT

Ghent is famed for Azalea cultivation. There are over 500 nurseries in the town and suburbs, and in most of them the principal product is this Azalea. Many small gardens also are devoted to its cultivation, the large growers having a greater demand for plants than they could meet were it not for the assistance of the small growers. The annual output of Indian Azaleas from Ghent alone must run into a million. These are sent to the most distant parts of the world, New Zealand, Australia, South Africa, and Canada each taking their share. The principal buyers, however, are English, French, German, and American.

The Ghent methods of propagation and cultivation are the outcome of long experience. The climatic conditions there are peculiarly favourable to the growth of Azaleas. Most of the plants are grafted, the stocks used being *phœnicia* and *concinna*, the former being preferred by the best growers. They are raised from cuttings formed of the young sucker-shoots which develop on the stocks of young grafted plants ; these are removed in December and January and set in flat boxes or pans of sandy soil, which are placed on cinder beds in close cases or propagating frames, the temperature in which is maintained at about 70°. The glass of the frame rests within an inch of the cuttings, which are sprinkled often enough to keep them perpetually moist and are shaded from bright sunshine. In about four weeks the cuttings have formed roots, when the

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glass is raised a few inches higher and a little air is given. They are gradually hardened off, and about the middle of May, when all danger from frost is over, they are transferred to beds in the open air, and planted about 4 inches apart in sandy leaf-soil newly fetched from the woods. In the third week in July the plants are lifted, potted singly in thumb pots, placed under glass, and kept shaded and syringed. Some growers pot the plants when they are taken from the cutting boxes, and plunge the pots in the beds outside.

Grafting commences in August. The stocks are then about 9 inches high, with a single stem, leafy to the base, the lower part being fairly woody. They are cut obliquely to a height of 4 inches, and with a sharp, thin knife-blade they are slit to a depth of $\frac{3}{4}$ inch. The scion, which is about 2 inches long, is cut to a wedge shape and fitted in the slit ; grafting cotton is used as a binder. The grafted plants are placed in cases similar to those used for the cuttings, but they are not syringed, lest water should get between the stock and the scion. In from six to eight weeks a union is effected, when the glass covering is removed and the plants subjected to ordinary greenhouse conditions. When they start into growth, the top is pinched out and the cotton binding removed. In the following May they are planted out 3 or 4 inches apart, in beds of leaf-mould, in a position where they will receive full sunshine. They are watered overhead daily, sometimes twice a day.

Success with Azaleas in Ghent is largely due to the subsoil there being a fine sand to a considerable depth. This keeps the beds sweet, however much water is applied, and Azaleas cannot easily be over-watered there in summer.

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During the summer the beds receive three or four waterings with liquid manure, which is either drainings from stables or from cesspits. It is also a common practice to top-dress the beds, soon after the plants are set out, with malt sprouts from the breweries. This is believed to be an excellent stimulant for Azaleas, but when used extravagantly it often gives rise to canker. The plants are lifted from the beds in October, and placed so close together that the tops touch each other on stages close to the glass in low houses, leaf-soil being put about their roots ; they remain there until May, when they are again planted out. This round of treatment is repeated annually as long as the plants are in the nursery. Most of them are disposed of when they are three years old from the date of grafting.

The pinching of the shoots to compel the plants to form good heads requires to be done by an experienced grower. The shoots are never allowed to grow more than about 3 inches, or "6 leaves long" as it is reckoned. Pinching is done in summer whilst growth is active. During the winter the plants are examined, and the shoots regulated by tying or pruning to get a well-formed head. The houses or frames in which the plants are wintered are kept cool and airy, and in frosty weather a temperature just above freezing-point is maintained. Azaleas rarely require to be watered in winter. The roots are so fibrous, and they form, with the leaf-mould, such a close mat or ball, that there is no danger of injury from transplanting ; consequently they are not potted until they reach the purchaser.

A few varieties are raised from cuttings, and the plants are sold when they are small. These are Charles Enke, Mde. de Cruysen, Louise Marie, and Hexe.

INDIAN AZALEAS

Selection of Varieties

A. Borsig.	Mde. H. Seidel.
American Beauty.	Mde. C. Van Langenhove.
Apollo.	Mdle. M. Rosseel.
Baronne de Vriere.	Mde. Van der Cruyssen.
Bernard Andreas.	*Memoire de L. Van Houtte.
*B. Andreas alba.	Major Holford.
Centenaire.	Niobe.
Ceres.	*Othello.
Comtesse E. de Ker-	Pauline Mardner.
chove.	President Kerchove.
†Deutsche Perle.	†Professor Wolters.
*Dr. Moore.	Perle de Belgique.
Edmond Vervaene.	Paul Weaver.
Empereur du Bresil.	Rosa Bonheur.
Ernest Eckhaute.	Rudolf Seidel.
G. P. Stephens.	†Simon Mardner.
†Hermosa.	*Schryveriana.
Imperatrice des Indes.	Sir J. T. D. Llewelyn.
Juno.	*Souvenir du Prince Albert.
Julius Roehrs.	†Talisman.
Leda.	Thalia.
Louise Pynaert.	Vervaeiana.
Mde. J. Vervaene.	V. alba.
Mde. Petrick.	Virginal.
Mde. E. Eckhaute.	Vuylstekeana.

* Late flowerers.

† First earlies, good for early forcing.

CHAPTER IX

JAVANICUM HYBRIDS FOR WARM GREENHOUSE

Rhododendron javanicum was introduced into cultivation by Messrs. J. Veitch & Sons through their collector, Thomas Lobb, and it flowered first in their nursery in 1847. It is a sturdy evergreen shrub, with leaves as large as those of *R. ponticum*, but thicker, and the heads have from eight to twelve large, fleshy, orange-yellow flowers, with a few scattered, red spots. It grows in moist forests at a high elevation in Java, and under cultivation it requires the conditions of a warm, moist greenhouse.

In the development of the race known as Javanicum hybrids this species has played quite as important a part as *R. catawbiense* did in the production of the hardy race. Crossed with other species from the Malay regions—viz. *R. jasminiflorum*, *R. Teysmannii*, *R. Brookeanum*, *R. multicolor*, and *R. malayanum*—and their progeny with each other, about two hundred hybrids and crosses have been obtained, their colours ranging from deep crimson to rich golden-yellow and pure-white, and their forms from that of a Jasmine to big bell-shaped flowers, and double in some cases as the tuberose (*balsamiflorum*). The first of these hybrids sent out by Messrs. Veitch, in whose nurseries they have all been raised, the early ones by Taylor, and the later by Heal, was Princess Royal, soon afterwards followed by Duchess of Edinburgh and Taylori.

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All the species of the Javanicum race and the hybrids and crosses raised from them, require the conditions of a warm greenhouse. In summer, moisture and shade are of most importance. The minimum temperature for them is about 55° F., and they are happiest when kept under glass all the year round. Most of them are epiphytes where they are wild, growing on the branches and stems of large trees in moist forests on the mountains of Java and Borneo, where the conditions are such as Orchids luxuriate in. In cultivation they are satisfactory only when grown in sandy soil, chiefly peat.

In the belief that border cultivation would be as suitable for them as it is for other species, a collection was planted out in the Mexican House at Kew. Here they grew exceptionally well, but there was some unascertained condition wanting, and after the first year or so they failed to flower. Cultivated in pots, however, they flower freely and continuously, the plants having at the same time shoots in various stages of development as well as flowers, in consequence of which they are in flower practically all the year round. To prove this, Messrs. J. Veitch & Sons some years ago exhibited at every fortnightly meeting of the R.H.S. for a whole year, a collection of the flowers which had been produced, not by special treatment, but under quite normal conditions.

They are propagated by means of half-ripened shoots which readily strike root in a propagating case, and they are amenable to training and pinching, so that they can be kept to convenient size and shape. They do not appear to grow large, the highest being less than 6 feet. They require to be kept moist all the year round, frequent spraying overhead being good for them, especially in summer.

PLATE VII
JAVANICUM HYBRIDS

KING EDWARD VII. (YELLOW) AND NE PLUS ULTRA (RED)

King Edward VII. is a hybrid from *R. javanicum* (Java) and *R. Teysmanii* (Sumatra). Ne Plus Ultra is from a cross between *R. javanicum* and Duchess of Edinburgh, this latter being a hybrid from *R. Lobbianum* and *R. Brookeanum*.



The following is a selection of the best varieties :—

Aphrodite, blush-pink suffused with white.

Apollo, orange-scarlet.

Baroness Henry Schröder, delicate rose ; finest of the light-coloured varieties.

Brilliant, scarlet, flowers of fine form, $2\frac{1}{2}$ inches in diameter.

Clorinda, deep rose, distinct.

Diadem, bright orange-scarlet tinted with carmine.

Duchess of Edinburgh.

Hercules, bright fawn-yellow toned with rose-pink.

Indian Yellow, rich orange-yellow.

Jasminiflorum, white with pink eye.

Jasminiflorum carminatum, rich carmine.

King Edward VII., bright-yellow flowers, in large, bold trusses. (See Plate VII.)

Luteo-roseum, satiny rose suffused with white, the centre light-yellow.

Ne Plus Ultra, figured in Plate VII.

President, clear buff-yellow tinted with rose, red filaments.

Primrose, the purest primrose-yellow yet obtained.

Princess Alexandra, white with a faint tinge of blush.

Princess Beatrice, light-yellow suffused with pink.

Princess Royal, light rose-pink, dark centre.

Souvenir de H. J. Mangles, orange-yellow suffused with rose-pink.

Sybil, rose-pink suffused with white.

The Queen, white with a cream-white centre, anthers rose and yellow.

Thetis, light tawny-yellow faintly tinted with rose.

An interesting paper on this race of hybrids, by Professor Henslow, was published in the *Journal of the Royal Horticultural Society*, vol. xiii. p. 240. The double-flowered varieties were obtained from a flower which possessed one or two petaloid stamens and was fertilised with its own pollen. From its seeds fifteen plants were raised, some of which had single flowers, others semi-double, and others quite double.

The species not only readily intercross, but the hybrids obtained from them are perfectly fertile. The present race is the result of crossing and recrossing to the fourth generation, so that there has been a thorough mixing of the characters of the several species used. Some interesting facts were elicited by these crossings. Thus, when a white flower was crossed with a yellow one, the progeny were either white or yellow, generally white. White crossed with orange sometimes yielded pink; crimson crossed with yellow gave scarlet; pink crossed with yellow gave pure yellow, except on the anthers, which were pink. As a rule, better forms of flowers and clearer colours are secured when hybrids are crossed with species than when hybrids are crossed with each other.

CHAPTER X

RHODODENDRONS FOR THE COOL GREENHOUSE

RHODODENDRONS are very serviceable in the greenhouse and conservatory. When the Sikkim species were first introduced they were treated in many gardens as tender plants that required to be kept in a minimum temperature of about 45°. And it is surprising how many can be satisfactorily grown in this fashion, if their needs with respect to moisture and fresh air are not overlooked. Where the outdoor conditions are not favourable to Rhododendrons, provision may easily be made for them under glass. This is done at Glasgow, in the Botanic Garden; they have no chance in the open air, but a good collection is accommodated and well grown in the large winter garden. A house without hot-water pipes is suitable for all except the hardiest species, and of course the *Javanicum* race. Borders of light soil, liberal ventilation, with plenty of moisture, and shade from hot sunshine, are the essentials. If the plants must be grown in pots or tubs, it is quite easy to make a selection from the sorts that are generally known as greenhouse Rhododendrons. If possible, they should be placed out-of-doors for the summer.

The following species and hybrids are recommended

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for cultivation in greenhouses, the temperature in which can be maintained at from 40° to 45° in winter :—

Beauty of Tremough.	<i>Formosum.</i>	Loderi.
<i>Calophyllum.</i>	Fosterianum.	Manglesii.
Countess of Hadding-	Fragrantissimum.	<i>Nuttallii.</i>
ton.	Gill's Triumph.	Princess Alice.
Cunninghamii.	Glory of Penjerrick.	Sesterianum.
<i>Dalhousiæ.</i>	<i>Grande</i> (argenteum).	<i>Thomsonii.</i>
<i>Edgeworthii.</i>	<i>Griffithianum.</i>	<i>Veitchianum.</i>
Exoniensis.	Lady Alice Fitz-	Williamsii.
<i>Falconeri.</i>	william.	

In addition to the above species and varieties, which are suitable either to be planted in a border or in large tubs or pots for permanent use in a conservatory, a large number of hardy Rhododendrons may be utilised for greenhouse furnishing. Many of the evergreen sorts bear forcing very well, and as they are easily lifted from the open ground, they may be set in a border inside a house or planted in tubs and subjected to treatment that will cause the flowers to open early. After the flowers are over the plants may be at once returned to their places in the open, and if given a little extra attention until their roots have got to work again, they will be none the worse for their spell in the greenhouse. A grand display of Rhododendrons may be provided in the early months of the year by treating the plants as here directed.

CHAPTER XI

MISCELLANEOUS HYBRIDS

MESSRS. ISAAC DAVIS & SONS, Ormskirk, bred a number of interesting hardy and semi-hardy hybrids from several of the smaller Himalayan species, such as *R. ciliatum*, *R. virgatum*, and *R. Edgeworthii*. *R. præcox*, one of the earliest and best, was raised by Davis from *R. dahuricum* and *R. ciliatum*; he also raised multiflorum—a delightful little, early-flowering, Azalea-like plant which forces well—from *R. virgatum* and *R. ciliatum*. *Davisii* is a cross between two hardy Azaleas, probably *R. sinense* and *R. nudiflorum*. To the same breeder we owe the sweet-scented hybrids grown in greenhouses and raised from *R. Edgeworthii* crossed with the hybrid multiflorum. They are all easy to manage in an ordinary plant-house, and are very floriferous and fragrant. Five of the best of them are Countess of Derby, Countess of Sefton, Duchess of Sutherland, Miss Davis, and Mrs. Shawe.

Messrs. Davis raised other hybrids from *R. dahuricum*. In 1892 they wrote: "We have now a number of seedlings of hardy hybrids raised from *R. dahuricum* and others, but it will take us a long time to work up a stock of them." These do not appear to have ever got into commerce.

Two hardy hybrids of exceptional merit, in that they are easily grown, floriferous, and yellow-flowered, are *Broughtonii aureum*, raised in the village of Broughton,

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Peeblesshire, and *Smithii aureum*, raised by Mr. Smith, Norbiton Nursery, near Kingston. Their parents are said to have been a yellow *Azalea* and a seedling evergreen *Rhododendron*. The two were at first supposed to be identical, but there are differences, Smith's plant having the leaves glaucous on the under side, which in the other hybrid is green. The flowers of *Broughtonii*¹ are a clearer yellow and less spotted. These two belong to what are known as *Azaleodendrons*. They possess the qualities that constitute a good garden plant, and are therefore an indication of what might be obtained by the breeder, working with Ghent or Mollis *Azaleas* and the evergreen *Rhododendrons*. Although quite hardy, they are easily grown in pots, and may be taken into a greenhouse to flower in spring.

¹ There is also a large pink flowered true *Rhododendron* known as *Broughtonii*.

CHAPTER XII

CULTIVATED SPECIES

R. albiflorum.—N. America. 1838. An erect shrub, 3 feet high. Deciduous. Leaves lance-shaped, bright-green, glabrous, 1 inch long. Flowers on axillary drooping peduncles, bell-shaped, 1 inch across, five-lobed, creamy-white ; calyx large. Hardy.¹

R. amœnium.—China. 1853. A compact, flat-topped shrub, 3 feet. Evergreen. Leaves ovate, dark-green, hairy beneath, 1 inch long. Flowers in small terminal clusters, corolla hose-in-hose, 1 inch across, magenta. Usually considered to be a form of *R. indicum*, but quite distinct. There are several named varieties of it. Hardy.

R. anthopogon.—Central and Northern Asia, 16,000 feet. 1820. A dwarf shrub. Evergreen. Branches twiggy, clothed with scales. Leaves small, densely scaly, red-scaly underneath ; odoriferous when bruised. Flowers in loose corymbs, bell-shaped, small, pale-yellow. Hardy.

R. arborescens.—N. America. 1825. A shrub, 3–10 feet. Deciduous. Leaves leathery, bright-green, glaucous beneath, with a few bristly hairs. Flowers later than the leaves, tubular, 2 inches long, white or tinged with rose, slightly hairy, stamens red, fragrant. Hardy.

R. arboreum.—Himalaya, &c., up to 10,000 feet. 1811. A tree, 20–50 feet. Evergreen. Leaves lanceolate, grey-

¹ The terms tender and hardy refer to the behaviour of the plants in the London district.

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green above, silvery or rust-coloured beneath, 5–10 inches long. Flowers in crowded heads, red, pink, or white, bell-shaped, 1 inch or more long, lobes five, small, stamens ten. Represented by several distinct varieties named *Campbellia*, *Windsori*, *cinnamoneum*, *album*, &c. Tender.

R. aucubæfolium.—China. 1900. A faked species. Leaves of *Daphniphyllum* and flowers of a *Rhododendron*. Done by Ah Sin !

R. Augustinii.—China. 1900. A shrub resembling *R. Yunnanense*. Leaves lance-shaped, 2–4 inches long. Flowers shallow, bell-shaped, with wide-spreading crisped lobes about $2\frac{1}{2}$ inches across, white, pink, or purple. Hardy.

R. auriculatum.—China. 1900. A shrub or tree up to 30 feet. Evergreen. Leaves leathery, oblong, 8–12 inches, lobed at the base. Flowers bell-shaped, 3 inches long, 4 inches wide, white or rose. Closely allied to *R. Griffithianum*. Tender.

R. barbatum.—Himalaya, 12,000 feet. 1829. A shrub or tree up to 40 feet. Evergreen. Leaves oblong, 8 inches by 2 inches, distinctly reticulated, green on both sides, petiole usually clothed with bristly hairs. Flowers in crowded, compact heads, bell-shaped, 14 inches wide, five-lobed, blood-red. Tender.

R. Benthamianum.—China. 1907. A shrub up to 10 feet. Evergreen. Allied to *R. Yunnanense*, from which it differs in its more densely scaled leaves and in the flowers being purple-violet, usually in threes, and over 2 inches across. Tender.

R. Boothii.—Bhotan, 8000 feet. 1858. A straggling bush, 6 feet, epiphytic. Evergreen. Leaves elliptic, covered with rust hairs when young, glabrous when mature, the margins sometimes ciliate, 5 inches long. Flowers in dense

corymbs, bell-shaped, five-lobed, 13 inches long, yellow. Tender.

R. brachycarpum.—Japan. 1888. A wide-spreading, evergreen shrub up to 10 feet. Resembles *R. catawbiense*, but the leaves are shorter and rust-hairy beneath. Flowers pale-yellow, spotted with green. Hardy.

R. Brookeanum.—Borneo. 1848. A sturdy shrub. Evergreen. Epiphytic. Leaves lance-shaped, leathery, smooth, dark-green above, scaly below, petioles purplish. Flowers in large umbels, fleshy, funnel-shaped, with five spreading lobes, orange-red. Greenhouse.

R. calendulaceum.—N. America. A shrub up to 8 feet. Deciduous. Leaves ovate, hairy. Flowers tubular, glandular, the spreading segments flame-coloured. Hardy.

R. californicum.—California. A sturdy shrub up to 8 feet. Evergreen. Leaves elliptic, 3–6 inches long, leathery, glabrous, bright-green above, paler beneath. Flowers in compact heads, bell-shaped, with wavy lobes, 1 inch long, rose-purple with yellow spots on the throat. Hardy.

R. calophyllum.—Bhotan, 4000 feet. 1850. A sturdy shrub 8 feet. Evergreen. Leaves oblong, leathery, glossy-green, glaucous and scaly beneath, 6 inches long. Flowers in loose corymbs, bell-shaped, 3 inches long and wide, with five spreading lobes, stamens about twenty, white, tinged with green. Tender. Sometimes treated as a variety of *R. Maddenii*, but the two are quite distinct.

R. campanulatum.—Himalaya, 14,000 feet. 1825. A large shrub up to 16 feet. Evergreen. Leaves elliptic, smooth, dark-green above, felted with rusty hairs beneath. Flowers in compact heads, bell-shaped, lilac-purple or white, 1 inch long, five-lobed. There are several varieties, named *Wallichii*, *Batemanii*, *album*, &c. Hardy.

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R. campylocarpum.—Sikkim, 14,000 feet. 1851. A sturdy shrub up to 8 feet. Evergreen. Leaves heart-shaped, green on both surfaces, with closely reticulating veins, about 3 inches long. Flowers honey-scented on slender pedicels, in loose heads, bell-shaped, yellow, 1 inch long. There is a white-flowered variety. Hardy.

R. camelliæflorum.—Himalaya, 13,000 feet. 1851. A shrub 6 feet. Evergreen. Leaves oblong, scaly beneath, 3 inches long. Flowers several together on short, scaly stalks, corolla wide-spreading, white, 1 inch across. Tender.

R. catawbiense.—S. United States. 1809. A stout shrub 3-6 feet. Evergreen. Leaves oblong, rounded at both ends, glabrous, dark-green above, paler beneath, 5 inches long. Flowers bell-shaped, lilac-purple with red spots. Hardy.

R. caucasicum.—Caucasus. 1803. A spreading shrub, 3 feet. Evergreen. Leaves lance-shaped or ovate, leathery, dark-green, rust-hairy beneath, margins revolute. Flowers in corymbs, bell-shaped, rose-red, white within, with green spots on the upper segments. There are several named varieties. Hardy.

R. Championæ.—China. 1890. An evergreen shrub 7 feet high, with the habit of *R. flavum*; leaves lanceolate, 3 inches long, dark-green, hairy. Flowers in compact umbels, 4 inches across, in shape like an Indian Azalea, pale-rose. Tender.

R. chartophyllum.—S. China. 1907. In the way of *R. Yunnanense*, but the leaves are narrower and not hairy, and the flowers are smaller.

R. ciliatum.—Himalaya, 10,000 feet. 1850. A spreading shrub, branches twiggy, 4 feet or more high. Evergreen.

Leaves elliptic, 2 inches long, clothed with scattered hairs. Flowers in loose corymbs, bell-shaped, $1\frac{1}{2}$ inch long, white, tinged with pink. Tender.

R. ciliicalyx.—China. 1900. A shrub similar to *R. formosum*, distinguished by its more robust habit, larger flowers, and hairs on the calyx. Tender.

R. cinnabarinum.—Himalaya, 12,000 feet. 1851. A straggling shrub 8 feet high. Evergreen. Leaves oblong, smooth, glaucous and scaly beneath, 3 inches long. Flowers in loose corymbs, narrow bell-shaped, distinctly lobed, fleshy, orange, dull-crimson, or brick-red. A most variable species, and includes varieties known as *Roylei* and *blandfordiflorum*. Hardy.

R. Collettianum.—Afghanistan. 1879. A shrub 8 feet, with grey branches. Evergreen. Leaves lance-shaped, dull-green, brown-scaly beneath, 3 inches long. Flowers in compact heads, tubular, spreading lobes less than 1 inch across, white. Hardy.

R. dahuricum.—North-Eastern China. 1780. An erect, twiggy shrub 3 feet. Deciduous. Leaves ovate, bright-green, pale beneath, 1 inch long, clustered at the ends of the twiggy branches. Flowers few, at the ends of the ripened shoots, bell-shaped, 1 inch across, rose-coloured. Hardy. The variety *sempervirens* has persistent leaves and purplish flowers.

R. Dalhousiæ.—Himalaya, 9000 feet. 1850. A sturdy, straggling shrub, often epiphytic. Evergreen. Leaves broadly oblong, smooth, glaucous green, sometimes ciliate, 4 inches long. Flowers in loose clusters, large, bell-shaped, white or creamy, fragrant, calyx large, with five spreading, leaf-like lobes. Tender.

R. decorum.—China. No doubt the Chinese form of

R. Griffithianum. Leaves 9 inches long. Flowers fragrant. So far not a success under cultivation.

R. Delavayi.—China. 1894. A bush or small tree, very like *R. arboreum*. Evergreen. Leaves lance-shaped, leathery, dark-green, brown-felted beneath, 6 inches long. Flowers in compact heads, bell-shaped, with spreading lobes, 2 inches across, bright crimson. Tender.

R. Edgeworthii.—Himalaya, 9000 feet. 1851. A straggling shrub 6 feet. Evergreen. Branchlets woolly. Sometimes epiphytic. Leaves elliptic with strongly marked veins, rust-hairy on both sides, woolly beneath, 2-4 inches. Flowers in loose heads, broad bell-shaped, five-lobed, 3 inches across, white, fragrant. Tender.

R. Falconeri.—Himalaya, 9000-13,000 feet. 1850. A sturdy shrub or tree up to 30 feet. Evergreen. Leaves elliptic, 9 x 4 inches or larger, rugose, clothed beneath with rust-coloured felt. Flowers in crowded heads, bracts large, hairy, corolla bell-shaped, 2 inches long, 7-10 lobed, creamy white. Tender.

R. ferrugineum.—Alpine Rose. European Alps. 1752. A dwarf shrub, 1 foot high. Evergreen, with Box-like foliage, shining green above, red-scaly beneath, hairy when young. Flowers in small, compact umbels, tubular, with spreading lobes, 1 inch across, rose red, with small yellowish punctures. Hardy. The var. *albiflorum* has white flowers.

R. flavidum (primulinum).—China. 1910. A compact shrub 1-2 feet high, branches twiggy and scaly. Evergreen. Leaves Myrtle-like, ovate, less than 1 inch long, green and scaly on both surfaces. Flowers in clusters of 3-5, shallow, bell-shaped, about 1 inch long, divided into five wavy lobes, pale-yellow, stamens spreading. Hardy.

PLATE VIII
DONCASTER



R. flavum.—Caucasus, &c. 1798. A deciduous shrub, with twiggy, smooth branches, ovate, hairy leaves, green tinged with brown. Flowers 2 inches wide, in compact umbels, base tubular, lobes spreading, irregular, bright yellow, fragrant. Generally known as *Azalea pontica*. Said to be poisonous. One of the parents of Ghent Azaleas. Hardy.

R. Fordii.—China. 1894. A compact shrub up to 8 feet. Evergreen. Leaves lance-shaped, leathery grey-green, brown and felted beneath, 3 inches long. Flowers in loose corymbs, with large brown bracts, corolla bell-shaped, 2 inches across, pink outside, white inside, with crimson spots. Tender.

R. formosum.—Bhotan, &c. 1815. A shrub 3–8 feet. Evergreen, twiggy. Leaves 1–3 inches, varying in size and form, glabrous or hairy, glandular beneath. Flowers in loose corymbs, bell-shaped, 1–4 inches long, with large spreading lobes, white or tinged with pink, fragrant, calyx with small teeth, sometimes hairy. Variable, and represented in gardens by several distinct forms. Tender.

R. Fortunei.—China. 1859. A sturdy shrub up to 12 feet high. Evergreen. Leaves oblong, dull-green above, glaucous beneath, with purplish petioles. Flowers in loose racemose heads, saucer-shaped, 3–5 inches in diameter, generally divided into seven lobes, white, tinged with pink, very fragrant. Hardy.

R. fulgens.—Sikkim, 14,000 feet. 1851. A sturdy shrub up to 10 feet. Evergreen. Leaves ovate, 3 inches long, rust-hairy beneath, dark green above. Flowers in small, dense heads, blood-red, bell-shaped, 1 inch long, five-lobed. Hardy.

R. glaucum.—Sikkim, 12,000 feet. 1850. A shrub 2 feet. Evergreen. Leaves oblong, scaly, glaucous beneath,

3 inches long, fragrant, corymbs about ten flowered, corolla, bell-shaped, $\frac{1}{2}$ inch long. Hardy.

R. grande.—Himalaya, 11,000 feet. 1850. A tree up to 30 feet. Evergreen. Leaves oblong, 9 inches by 3 inches, green above, silvery below, nerves prominent. Flowers in large, dense heads, with hairy bracts, white, pink in bud, bell-shaped, 3×2 inches, lobes erect, five to eight, stamens more than ten. Also known as *R. argenteum*. Tender.

R. Griffithianum.—Himalaya, 9000 feet. 1850. A stout, spreading shrub or tree up to 40 feet. Evergreen. Leaves oblong, 6 inches to 10 inches, rounded at both ends, green on both sides, with closely reticulating veins. Young growths clothed with long, rose-red bracts. Flowers in loose heads with long pedicels, saucer-shaped, 6 inches across, pink in bud, pure-white when expanded, very fragrant. The largest-flowered species. Also known as *R. Aucklandii*. Tender.

R. Harrovianum.—China. 1910. An evergreen shrub about 3 feet high, not unlike *R. punctatum*, but leaves scaly only on lower surface, lanceolate, 3 inches long. Flowers in clusters of 3-5, similar to those of a small form of *R. ponticum*, mauve-purple, yellowish, and spotted on upper lobes. Hardy.

R. hirsutum.—Alpine Rose. European Alps. 1656. A dwarf shrub rarely more than 1 foot high, branches crowded. Evergreen. Leaves elliptic, hairy, rust-scaly beneath, 1 inch long. Flowers in compact umbels, funnel-shaped, bright-red, with minute brownish punctures. Hardy.

R. Hodgsonii.—Eastern Himalaya, 12,000 feet. 1851. A sturdy shrub up to 20 feet. Evergreen. Leaves stout, oblong, 10×4 inches, hairy, rust-coloured beneath, dark-green above. Flowers in crowded heads, rose-purple, bract

large, silky, corolla bell-shaped, 6–10 lobed, stamens fourteen or more. Tender.

R. Hookeri.—Bhotan, 8000 feet. 1860. A large shrub. Evergreen. Leaves oblong, rounded at both ends, green on both sides, 5 inches long, with stellate tufts of hair at the base of the principal nerves. Flowers in small compact heads, bell-shaped, 1 inch long, blood-red, calyx cup-shaped. Tender.

R. indicum.—China. A shrub with virgate branches of sub-horizontal growth. Evergreen. Leaves ovate, 1–2 inches long, hairy, green. Flowers, several, at the ends of the short branches. Very variable as to size and colour. Tender. The parent of the Indian Azaleas, largely grown in greenhouses. There are several wild varieties.

R. intricatum.—Yunnan. 1907. A densely branched shrub up to 3 feet. Evergreen. Leaves oblong, scaly, $\frac{1}{2}$ inch long. Flowers in clusters of five, small, violet-blue. Tender.

R. irroratum.—China. 1890. A sturdy shrub 6 feet or more high. Evergreen. Leaves lance-shaped, convex, green on both sides, 4 inches long. Flowers with terminal heads, bracts conspicuous, brown, narrow bell-shaped, $1\frac{1}{2}$ inch long, lobes short, white tinted and spotted with rose. Tender.

R. jasminiflorum.—Mountains of Malaya. 1849. A small shrub. Evergreen. Leaves elliptic, leathery, scaly beneath, 2 inches long. Flowers in an umbel, 6 inches long, tube narrow, $1\frac{1}{2}$ inch long, white, lobes small, spreading. Greenhouse.

R. javanicum.—Mountains of Malaya. 1847. A large shrub. Evergreen. Leaves lance-shaped, 6 inches long, glabrous on both sides. Flowers many, in corymbs,

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orange-red, tubular, 2 inches long, lobes rounded, spreading. Greenhouse.

R. Kæmpferi.—1892. Japan. Formerly included under *R. indicum*, from which it differs in being deciduous, with the flowers in umbels, and having yellow instead of purple anthers. Tender.

R. kamtschaticum.—N.E. Asia and N.W. America. 1802. A dwarf shrub 6 inches high. Deciduous. Branches sub-erect. Leaves tongue-shaped, 2 inches long, herbaceous, hairy. Flowers solitary, terminal; calyx composed of five green, leaf-like lobes; corolla carmine-purple with crimson dots, $1\frac{1}{2}$ inch across, divided at the base into five spreading, oblong lobes $1\frac{1}{2}$ inch wide, hairy outside; stamens ten. Hardy.

R. Keiskei.—Japan. 1908. An evergreen shrub, like *R. triflorum*, about 6 feet high, densely branched. Leaves leathery, green, tinged with brown, petioles red, 2 inches long. Flowers in clusters of 3-5, 2 inches across, shallow bell-shaped, wide-spreading lobes, lemon-yellow; anthers red. Hardy.

R. Kendrickii.—Bhotan, 7000 feet. 1859. A large shrub. Evergreen. Leaves lanceolate, 6 inches long, green on both sides, hairy when young. Flowers in rather loose heads, bell-shaped, with five broad, spreading lobes, $1\frac{1}{2}$ inch long, crimson. Tender.

R. Keysii.—Bhotan, 10,000 feet. 1851. A virgate shrub up to 6 feet, branches thin. Evergreen. Leaves lance-shaped, 3 inches long, glabrous, red-scaly beneath. Flowers less than 1 inch long, in loose clusters, tubular, lobes scarcely spreading, brick-red and yellow. Tender.

R. Kingianum.—Manipur. 1882. A robust shrub with stout, erect branches. Evergreen. Leaves ovate, convex,

wrinkled, dark-green, rust-hairy beneath, 3-6 inches long, petiole short, stout. Flowers in a crowded globose head, bell-shaped, with spreading bi-lobed segments, $1\frac{1}{2}$ inch in diameter, deep crimson. Allied to *R. arboreum*. Tender.

R. lacteum.—China. 1889. A sturdy shrub or small tree, not unlike *R. Falconeri*. Leaves thick, leathery, oblong, 12 inches or more long, brown-felted beneath. Flowers in a compact truss, bell-shaped, 2 inches across, white with purple blotch. Tender.

R. lanatum.—Himalaya, 13,000 feet. 1851. A large shrub. Evergreen. Leaves elliptic, obtuse, 4 inches long, hairy when young, becoming glabrous with age, rust-hairy beneath. Flowers nodding, in a loose head, bell-shaped, 1 inch long, yellow. Tender.

R. lapponicum.—Arctic regions. 1825. A dwarf, evergreen, Myrtle-like shrub, with rigid branches and elliptic leaves, $\frac{1}{2}$ inch long, clothed with rust scales, fragrant when bruised. Flowers few, in an umbel, bell-shaped, five-lobed, $\frac{1}{2}$ inch across, rosy-red, with crimson blotches. Hardy.

R. ledifolium.—China, &c. 1819. An evergreen shrub, resembling *R. indicum*, and probably only a variety of it. Leaves dull-green, hairy, closely arranged on the twiggy branches. Flowers white. Used as a stock for varieties of the Indian Azalea. Hardy.

R. lepidotum.—Himalaya, 15,000 feet. 1829. A straggling shrub up to 6 feet. Evergreen. Leaves variable, about $\frac{1}{2}$ inch long, glabrous, fragrant. Flowers in twos or threes on the twiggy branches, bell-shaped, yellow or purple; corolla 1 inch, scaly. Hardy.

R. leptocarpum.—Bhotan, 8000 feet. 1853. A slender alpine branching shrub about 1 foot high. Evergreen. Leaves oblong, glabrous, finely reticulated, 3 inches long.

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Flowers in corymbs, bell-shaped, 1 inch across, white. Tender.

R. linearifolium.—Japan. 1869. A small shrub with slender branches. Evergreen. Leaves few, linear, hairy, 2-4 inches long. Flowers in terminal clusters, corolla divided almost to the base into five narrow, spreading petals, about 1 inch long, red-purple. Tender.

R. Maddenii.—Sikkim, 6000 feet. 1850. A shrub 8 feet. Evergreen. Leaves oblong, glabrous, scaly beneath, 6 inches long. Flowers in corymbs, bell-shaped, 4 inches long, with five spreading, rounded lobes, white, tinged with rose, slightly scaly outside. Also known as *R. Jenkinsii*. Tender.

R. Malayanum.—Mountains of Malaya. 1854. A large shrub. Evergreen. Leaves lance-shaped, scaly beneath 3 inches long. Flowers in umbels, tubular, an inch long, red, lobes small, spreading. Greenhouse.

R. Mariesii.—Central China. 1886. A shrub 3-6 feet, with thin branches. Deciduous. Leaves ovate, hairy when young, green and glabrous when mature, 2 inches long. Flowers usually in pairs, rotate, $1\frac{1}{2}$ inch across, pink with crimson spots. Tender.

R. maximum.—American Laurel or Rose Bay. North America. 1738. A bushy tree up to 40 feet high, trunk sometimes 1 foot in diameter. Evergreen. Leaves ovate or lance-shaped, leathery, glabrous, dark-green above, paler beneath, 4-12 inches long; flowers fragrant, in umbellate clusters, shallow bell-shaped, divided into five ovate lobes, about $1\frac{1}{2}$ inch wide, white, rose, or purplish, the stalk and calyx of the same colour. Flowers in midsummer. Hardy.

R. Metternichii.—Japan. 1870. An evergreen shrub, 3

feet high, with oblong leathery leaves, green above, rust hairy beneath, 6 inches long. Flowers in compact heads, bell-shaped, rose-pink. Hardy.

R. micranthum.—China. 1900. A bush 4–20 feet high. Leaves obovate, dark-green, rust-scaly beneath, $1\frac{1}{2}$ inch long. Racemes, 2 inches long, composed of small white flowers $\frac{1}{4}$ inch in diameter. Tender.

R. modestum.—Himalaya. 1887. A small, much-branched shrub. Evergreen. Leaves elliptic, 3 inches long, leathery, clothed with dark, puncture-like scales. Flowers in loose umbels, bell-shaped, 1 inch across, pink with crimson spots. Allied to *R. ciliatum*. Tender.

R. mucronulatum.—Central Asia. 1907. A dwarf, deciduous shrub, allied to *R. dahuricum*. Leaves scattered, thin, lanceolate, 3 inches long, scaly. Flowers in clusters of 2–5, shallow, bell-shaped, bright rose. Hardy.

R. multicolor.—Sumatra. 1884. A small, slender shrub. Evergreen. Leaves in whorls, narrow lance-shaped, 3 inches long, green. Flowers in loose umbels, nodding, bell-shaped, 1 inch long, crimson or yellow. Greenhouse.

R. niveum.—Himalaya, 12,000 feet. 1850. A stout shrub. Evergreen. Leaves lance-shaped, about 6 inches long, mealy tomentose beneath. Flowers in compact heads, bell-shaped, lilac-purple, 4 inches long, lobes small, rounded. Tender.

R. nudiflorum.—N. America. A shrub up to 8 feet. Deciduous. Leaves soft, pubescent, ovate, 1–3 inches long. Flowers produced with leaves, tubular, 1 inch long, light rose to purple. There are numerous colour forms. Hardy.

R. Nuttallii. Bhotan, 5000 feet. 1859. A straggling shrub, often epiphytic. Evergreen. Leaves elliptic, leathery,

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rugose, dark-green, 8×4 inches, smooth on both sides, scaly beneath. Flowers few, in loose heads, long bell-shaped, white tinged with yellow at the base, 5 inches or more long and broad, fragrant, calyx lobes large and fleshy. Tender.

R. occidentale.—N. America. 1824. Shrub 2–6 feet. Deciduous. Leaves obovate, rather fleshy, hairy when young, bright-green, 3 inches long. Flowers before the leaves in compact heads, fragrant, tubular, $2\frac{1}{2}$ inches long, white, tinged with rose and yellow. Also known as *R. calendulaceum*. Hardy.

R. Oldhamii.—Formosa. 1882. A dwarf shrub. Deciduous. Leaves cuneate, lance-shaped, clustered, hairy when young. Flowers funnel-shaped, 2 inches across, salmon-red. Tender.

R. ovatum.—China. 1844. A virgate shrub 6 feet. Evergreen. Leaves Myrtle-like, 1 inch long, shining green. Flowers in loose terminal clusters, rotate, 1 inch across, pale purple. Tender.

R. parvifolium.—Siberia. 1877. An erect virgate shrub about 1 foot high. Leaves oblong, scaly, green above, rusty beneath, $\frac{1}{2}$ inch long. Flowers in umbels, like those of the Myrtle, rose-coloured. Very near *R. lapponicum*. Hardy.

R. pendulum.—Himalaya, 11,000 feet. 1860. A small shrub with pendulous branches, often epiphytic. Evergreen. Leaves elliptic, $1\frac{1}{2}$ inch long, rust-hairy beneath. Flowers in loose heads, campanulate, five-lobed, $\frac{3}{4}$ inch long, white, scaly outside, calyx large in proportion. Hardy.

R. ponticum.—Asia Minor and Portugal. 1763. A spreading shrub up to 12 feet. Evergreen. Leaves lance-

shaped, dark-green, paler beneath. Flowers in corymbs, bell-shaped, distinctly lobed, purple to white. There are numerous varieties. Hardy.

R. Przewalskii.—China. 1899. Compact shrub. Evergreen. Leaves oblong, 3–5 inches, leathery, dark-green. Flowers in compact heads, white, bell-shaped, with rounded lobes. Hardy.

R. punctatum.—N. America. A spreading shrub 6 feet. Evergreen. Leaves elliptic, up to 3 inches long, smooth, thickly dotted with resinous globules. Flowers in compact heads, funnel-shaped, 1 inch across, rose-red, with darker spots. Hardy.

R. racemosum.—Yunnan. 1890. A compact, Box-like plant. Deciduous. Leaves ovate, less than 1 inch, with scale-like punctures. Flowers in loose terminal clusters with a short tube, spreading lobes, and a conspicuous cluster of stamens. Hardy.

R. retusum.—Java, 3000 feet. 1855. A shrub, 2 feet. Evergreen. Leaves obovate, leathery, dark-green, slightly scaly beneath. Flowers in loose umbels, nodding, tubular, 1½ inch long, bright scarlet, paler inside. Greenhouse.

R. Rhodora.—N. America. 1767. A deciduous shrub 5 feet high, with brown twiggy branches, lanceolate hairy leaves 1½ inch long. Flowers preceding the leaves in April in compact clusters, Honeysuckle-like, rose-purple. Also known as *Rhodora canadensis*. Hardy.

R. rhombicum.—Japan. 1894. A deciduous shrub 4 feet high. Leaves rhomboid, dark-green tinged with purple, smooth. Flowers produced in pairs in April before the leaves, flat, 2 inches across, purplish-rose. Tender.

R. rubiginosum.—Yunnan. 1894. A rigid shrub, 3 feet. Evergreen. Leaves ovate, 3 inches long, dark-green

above, yellow and scaly beneath. Flowers in loose corymbs, bell-shaped, $1\frac{1}{2}$ inch across, rosy-lilac with red spots. Hardy.

R. scabrifolium.—Yunnan. 1888. A small, rigid shrub, hairy all over. Evergreen. Leaves lance-shaped, green, dotted with scales below, 3 inches long. Flowers in loose umbels, shallow, bell-shaped, about 1 inch across, white and pink. Tender.

R. Schlippenbachii.—Manchuria. 1863. A shrub 5 feet. Deciduous. Leaves in a terminal cluster, obovate, hairy, dark-green, 2-4 inches long. Flowers preceding the leaves, in loose umbels, Azalea-like, pale-rose with brown spots, 3 inches across. Hardy.

R. serpyllifolium.—Japan. 1882. A scrubby, rigid, hairy shrub, 1 foot. Deciduous. Leaves very small, green. Flowers also small, solitary, on short branchlets, purple. Tender.

R. sinensis.—China and Japan. 1824. A compact, deciduous shrub, with upright branches, about 5 feet high. Leaves ovate, crinkled, hairy, light-green, 2 inches long. Flowers in compact clusters, produced before the leaves, bell-shaped, orange-red. Better known as *Azalea mollis*. The parent of many good garden hybrids and seedlings. Hardy.

R. Smirnovii.—Trans-Caucasia. 1886. A small tree up to 20 feet. Evergreen. Branches and leaves felted, the latter oblong, leathery, dark-green above, brown-felted beneath, 3-5 inches long. Flowers in a large, compact head, tube short, corolla wide open, 3 inches diameter, margins crisped, rosy-lilac, with green spots. Hardy.

R. Souliei.—China. 1909. A shrub, 3-12 feet. Evergreen. Leaves thick, ovate, cordate, dark-green, glaucous

when young, 2-3 inches long. Flowers 3 inches wide, saucer-shaped, blush-pink, changing almost to white. Calyx glandular, ciliate. Hardy.

R. Thomsonii.—Sikkim, 13,000 feet. 1851. A large shrub up to 15 feet. Evergreen. Leaves elliptic, heart-shaped, dark-green above, glaucous beneath, finely reticulated, about 3 inches long. Flowers in compact heads, bell-shaped, 1-2 inches long and wide, blood-red. Calyx cup-shaped. Hardy.

R. triflorum.—Himalaya, 8000 feet. 1850. A virgate shrub up to 8 feet. Evergreen. Leaves elliptic, thin, grey-green, scaly beneath, 2 inches. Flowers usually in threes, tubular, 1 inch long and wide, pale-yellow. Tender.

R. Ungernii.—Trans-Caucasia. 1886. A sturdy shrub up to 12 feet. Evergreen. Leaves lance-shaped, leathery, dark-green above, felted beneath, 4-6 inches long. Flowers in compact clusters, shallow bell-shaped, spreading lobes, 2 inches across. Pale-rose, tinted with red. Hardy.

R. Vaseyi.—N. America. 1888. A shrub or small tree up to 18 feet. Deciduous. Leaves lance-shaped, bright-green, 2-3 inches long. Flowers preceding the leaves, in loose umbels, tubular, spreading lobes, $1\frac{1}{2}$ inch across, pink with red spots. Hardy.

R. Veitchianum.—Moulmein, 7000 feet. 1850. A shrub about 8 feet high, sometimes epiphytic, stem swollen at the base. Evergreen. Leaves lance-shaped, smooth, with red scales beneath, 4 inches long. Flowers in loose umbels, wide bell-shaped, with large wavy lobes, white, very fragrant, stamens twelve or more. Closely related to *R. formosum*. Greenhouse.

R. virgatum.—Himalaya, 9000 feet. 1850. A shrub up to 4 feet, with thin, scaly branchlets. Evergreen. Leaves

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oblong, punctate above, glaucous and scaly beneath, 2 inches long. Flowers clustered in the axils of the upper leaves, bell-shaped, with spreading lobes, 1 inch across, flesh-coloured. Tender.

R. viscosum.—N. America. 1734. A deciduous shrub 3 feet high, with thin branches, green ovate leaves 2 inches long, with hairy margins and midrib. Flowers in compact clusters, tubular, the lobes spreading 1 inch across, white, viscous, fragrant. One of the parents of a late-flowering race of Ghent Azaleas. Hardy.

R. Wightii.—Sikkim, 14,000 feet. 1851. A shrub, 6–14 feet. Evergreen. Leaves oblong, 7 inches long, dark-green above, rust-hairy beneath, closely reticulate, reddish when young. Flowers, many, in lax heads, yellow, bell-shaped, 1½ inch long, five-lobed, ten stamens. Seeds large for *Rhododendron*. Probably hardy.

R. yunnanense.—Yunnan. 1894. Erect, freely branched shrub 6 feet or more. Evergreen. Leaves elliptic, leathery, hairy, dark-green, 3 inches long. Flowers in loose heads, erect, Azalea-like, 2 inches across, white with crimson spots. Hardy.

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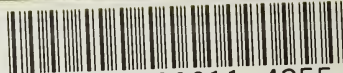
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